Purple Line

Natural Resources Technical Report

September 2008

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1. Introduction to Purple Line

The Maryland Transit Administration (MTA) is preparing an Alternatives Analysis and Draft Environmental Impact Statement to study a range of alternatives for addressing mobility and accessibility issues in the corridor between Bethesda and New Carrollton, Maryland. The corridor is located in Montgomery and Prince George's Counties, just north of the Washington, D.C. boundary. The Purple Line would provide a rapid transit connection along the 16-mile corridor that lies between the Metrorail Red Line (Bethesda and Silver Spring Stations), Green Line (College Park Station), and Orange Line (New Carrollton Station). This Purple Line Natural Resources Technical Report presents the analysis of potential effects that was summarized in the Alternatives Analysis and Draft Environmental Impact Statement. It describes the methodology used for the analysis and the results of that analysis.

1.1. Background and Project Location

Changing land uses in the Washington, D.C. area have resulted in more suburb-to-suburb travel, while the existing transit system is oriented toward radial travel in and out of downtown Washington, D.C. The only transit service available for east-west travel is bus service, which is slow and unreliable. A need exists for efficient, rapid, and high capacity transit for east-west travel. The Purple Line would serve transit patrons whose journey is solely east-west in the corridor, as well as those who want to access the existing north-south rapid transit services, particularly Metrorail and MARC.

The corridor has a sizeable population that already uses transit and contains some of the busiest transit routes and transfer areas in the Washington, D.C. metropolitan area. Many communities in the corridor have a high percentage of households without a vehicle, and most transit in these communities is bus service. Projections of substantial growth in population and employment in the corridor indicate a growing need for transit improvements. The increasingly congested roadway system does not have adequate capacity to accommodate the existing average daily travel demand, and congestion on these roadways is projected to worsen as traffic continues to grow through 2030.

A need exists for high quality transit service to key activity centers and to improve transit travel time in the corridor. Although north-south rapid transit serves parts of the corridor, transit users who are not within walking distance of these services must drive or use slow and unreliable buses to access them. Faster and more reliable connections along the east-west corridor to the existing radial rail lines (Metrorail and MARC trains) would improve mobility and accessibility. This enhanced system connectivity would also help to improve transit efficiencies. In addition, poor air quality in the region needs to be addressed, and changes to the existing transportation infrastructure would help in attaining federal air quality standards.

1.1.1. *Corridor Setting*

The Purple Line corridor, as shown in **Figure 1-1**, is north and northeast of Washington, D.C., with a majority of the alignment within 1 to 3 miles of the circumferential I-95/I-495 Capital Beltway.

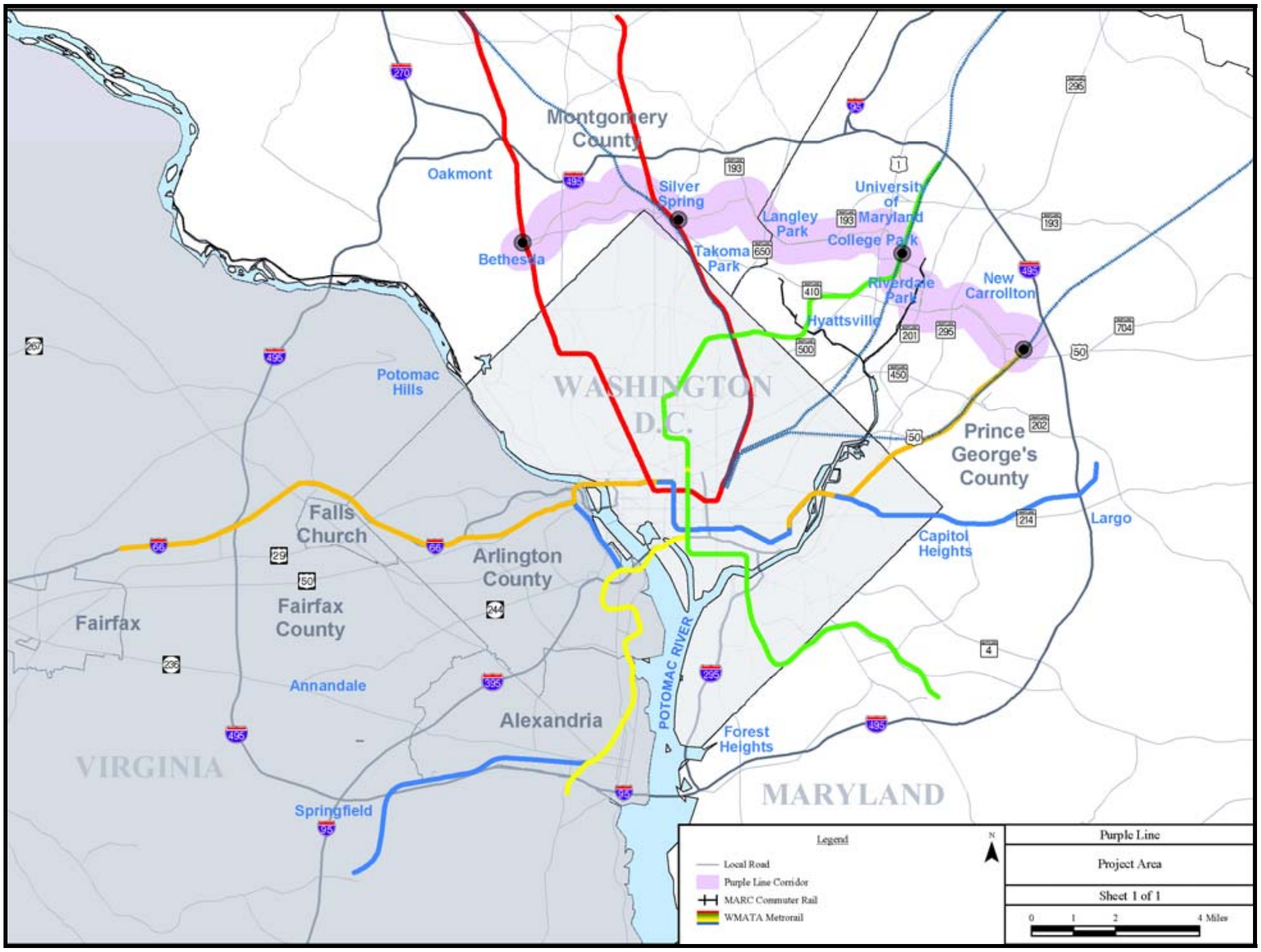

Figure 1-1: Project Location

1.2. Alternatives Retained for Detailed Study

The Purple Line has identified eight alternatives for detailed study, shown on **Figure 1-2**. The alternatives include the No Build Alternative, the Transportation System Management (TSM) Alternative, and six Build Alternatives. The Build Alternatives include three using bus rapid transit (BRT) technology and three using light rail transit (LRT) technology.

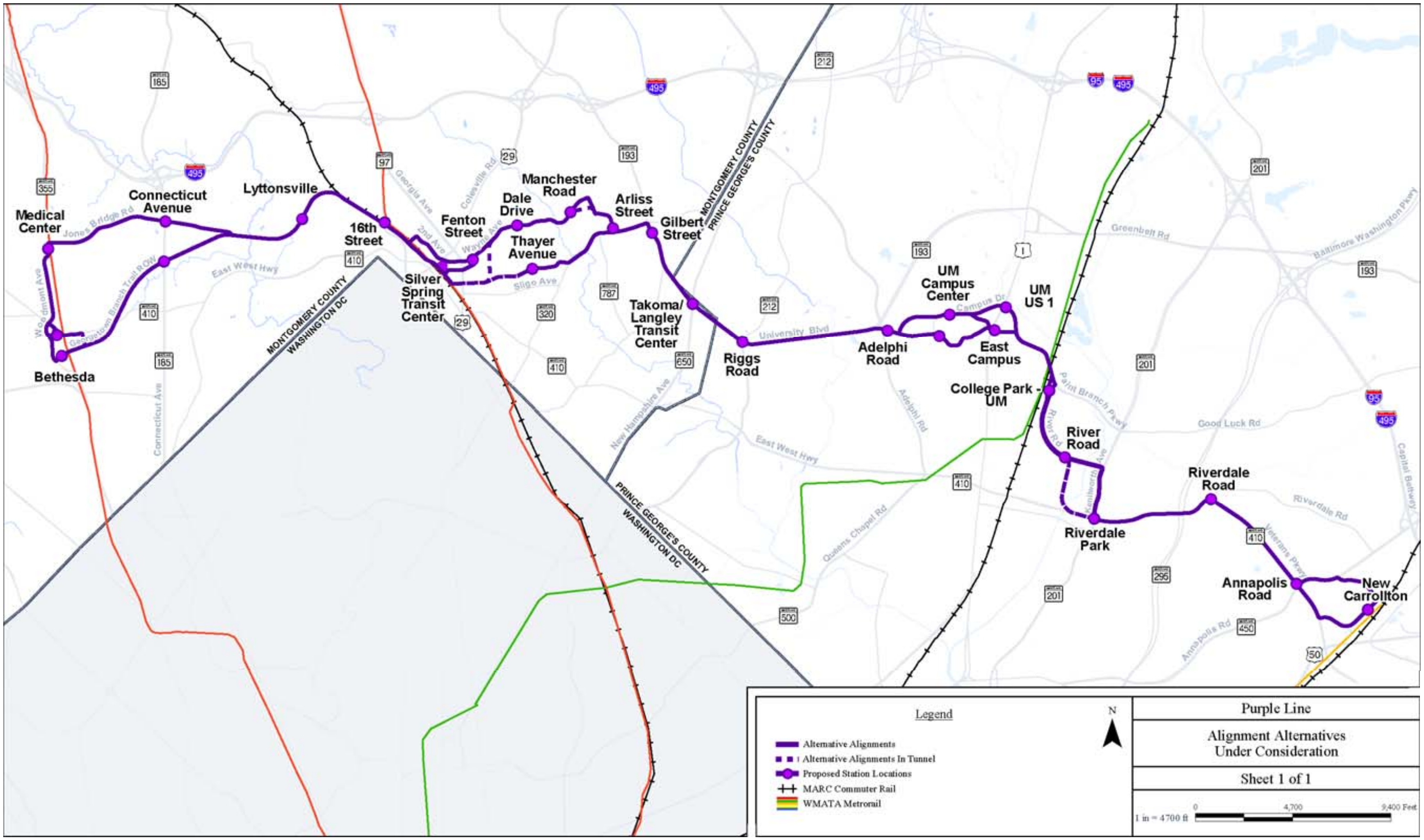

Figure 1-2: Alternative Alignments

All alternatives extend the full length of the corridor between the Bethesda Metro Station in the west and the New Carrollton Metro Station in the east, with variations in alignment, type of running way (shared, dedicated, or exclusive), and amount of grade-separation options (e.g., tunnel segments or aerial). For purposes of evaluation, complete alignments need to be considered. These alternatives were used to examine the general benefits, costs, and impacts for serving major market areas within the corridor.

1.2.1. Alternative 1: No Build Alternative

The No Build Alternative is used as the baseline against which the other alternatives are compared for purposes of environmental and community impacts. The No Build Alternative consists of the transit service levels, highway networks, traffic volumes, and forecasted demographics for horizon year 2030 that are assumed in the local Constrained Long Range Plan of the local metropolitan planning organization (in this case, the Metropolitan Washington Council of Governments).

1.2.2. Alternative 2: TSM Alternative

The TSM Alternative provides an appropriate baseline against which all major investment alternatives are evaluated for the Federal Transit Administration (FTA) New Starts funding program. The New Starts rating and evaluation process begins when the project applies to enter preliminary engineering and continues through final design.

The TSM Alternative represents the best that can be done for mobility in the corridor without constructing a new transitway. Generally, the TSM Alternative emphasizes upgrades in transit service through operational and minor physical improvements, plus selected highway upgrades through intersection improvements, minor widening, and other focused traffic engineering actions. A TSM Alternative normally includes such features as bus route restructuring, shortened bus headways, expanded use of articulated buses, reserved bus lanes, express and limited-stop service, signalization improvements, and timed-transfer operations.

1.2.3. Build Alternatives

The six Build Alternatives generally use the same alignments; only a few segments have locations where different roadways would be used. The differences between the alternatives are more often the incorporation of design features, such as grade separation to avoid congested roadways or intersections.

Alternative 3: Low Investment BRT

The Low Investment BRT Alternative would primarily use existing streets to avoid the cost of grade separation and extensive reconstruction of existing streets. It would incorporate signal, signage, and lane improvements in certain places. This alternative would operate mostly in mixed lanes with at-grade crossings of all intersections and queue jump lanes at some intersections. Southbound along Kenilworth Avenue and westbound along Annapolis Road, Low Investment BRT would operate in dedicated lanes. This is the only alternative that would operate on Jones Bridge Road, directly serving the National Institutes of Health and the National

Naval Medical Center near Wisconsin Avenue and Jones Bridge Road. It is also the only alternative that would use the bus portion of the new Silver Spring Transit Center (SSTC). A detailed description of the alternative follows.

From the western terminus in Bethesda, Low Investment BRT would originate at the Bethesda Metro Station bus terminal. The alignment would operate on Woodmont Avenue within the existing curb. At the Bethesda Station, the buses would enter the station via Edgemoor Road and exit onto Old Georgetown Road.

At Wisconsin Avenue, just south of Jones Bridge Road, the transitway would remain on the west side of the road in exclusive lanes. Low Investment BRT would turn onto Jones Bridge Road where the transit would operate in shared lanes with queue jump lanes westbound at the intersection with Wisconsin Avenue and westbound for the intersection at Connecticut Avenue. Some widening would be required at North Chevy Chase Elementary School.

The alignment would continue along Jones Bridge Road to Jones Mill Road where it would turn right (south) onto Jones Mill Road. Eastbound on Jones Bridge Road would be a queue jump lane at the intersection. From Jones Mill Road the alignment would turn east onto the Georgetown Branch right-of-way, where a new exclusive roadway would be constructed, with an adjacent trail on the south side.

Low Investment BRT would continue on the Georgetown Branch right-of-way, crossing Rock Creek Park on a new bridge, replacing the existing pedestrian bridge. The trail would also be accommodated on the bridge or on an adjacent bridge. A trail connection to the Rock Creek Trail would be provided east of the bridge. The alignment would continue on the Georgetown Branch right-of-way until the CSX corridor at approximately Kansas Avenue.

At this point, the alignment would turn southeast to run parallel and immediately adjacent to the CSX tracks on a new exclusive right-of-way. The trail would parallel the transitway, crossing the transitway and the CSX right-of-way east of Talbot Avenue on a new structure and continuing on the north side of the CSX right-of-way. The transitway would continue on a new roadway between the CSX tracks and Rosemary Hills Elementary School, and continue past the school. The transitway would cross 16th Street at grade, where a station would be located. The transitway would continue parallel to the CSX tracks to Spring Street, at which point it would connect to Spring Street and turn to cross over the CSX tracks on Spring Street. The alignment would continue on Spring Street to Second Avenue where it would turn east. Buses would operate in shared lanes on Spring Street and Second Avenue.

Low Investment BRT would cross Colesville Road at grade and continue up Wayne Avenue to Ramsey Street, where the buses would turn right to enter the SSTC at the second level.

The buses would leave the SSTC and return to Wayne Avenue via Ramsey Street. Low Investment BRT would continue east on Wayne Avenue in shared lanes. After crossing Sligo Creek Parkway, the alignment would operate in shared lanes.

At Flower Avenue, the alignment would turn left (south) onto Arliss Street, operating in shared lanes to Piney Branch Road. At Piney Branch Road, the alignment would turn left to continue in shared lanes to University Boulevard.

Low Investment BRT would follow University Boulevard to Adelphi Road. The lanes on University Boulevard would be shared. At Adelphi Road, the alignment would enter the University of Maryland (UM) campus on Campus Drive. The alignment would follow the Union Drive extension, as shown in the UM Facilities Master Plan (2001-2020), through what are currently parking lots. The alignment would follow Union Drive and then Campus Drive through campus in mixed traffic, and the main gate to US 1 (Baltimore Avenue).

Low Investment BRT would operate on Paint Branch Parkway to the College Park Metro Station in shared lanes. The alignment would then follow River Road to Kenilworth Avenue in shared lanes. Along Kenilworth Avenue, the southbound alignment would be a dedicated lane, but northbound would be in mixed traffic.

The alignment turns east from Kenilworth Avenue on East West Highway (MD) and continues in shared lanes on Veterans Parkway. This alignment turns left on Annapolis Road and then right on Harkins Road to the New Carrollton Metro Station. The westbound alignment on Annapolis would be dedicated, but the eastbound lanes would be shared.

Alternative 4: Medium Investment BRT

Alternative 4, the Medium Investment BRT Alternative, is, by definition, an alternative that uses the various options that provide maximum benefit relative to cost. Most of the segments are selected from either the Low or High Investment BRT Alternatives.

This alternative follows a one-way counter-clockwise loop from the Georgetown Branch right-of-way onto Pearl Street, East West Highway, Old Georgetown Road, Edgemoor Lane, and Woodmont Avenue and from there onto the Georgetown Branch right-of-way under the Air Rights Building. The buses stop at both the existing Bethesda Metro Station on Edgemoor Lane and at the new southern entrance to the Metro station under the Air Rights Building.

The alignment continues on the Georgetown Branch right-of-way with an aerial crossing over Connecticut Avenue and a crossing under Jones Mill Road.

This alignment, and all others that use the Georgetown Branch right-of-way, includes construction of a hiker-biker trail between Bethesda and the SSTC.

The alignment would continue on the Georgetown Branch right-of-way until the CSX right-of-way. The alignment would cross Rock Creek Park on a new bridge, replacing the existing pedestrian bridge. The trail would also be accommodated on the bridge or on an adjacent bridge. The alignment would continue on the Georgetown Branch right-of-way until the CSX corridor at approximately Kansas Avenue. This segment of the alignment, from Jones Mill Road to the CSX corridor, would be the same for all the alternatives.

As with Low Investment BRT, this alternative would follow the CSX corridor on the south side of the right-of-way, but it would cross 16th Street and Spring Street below the grade of the streets, at approximately the same grade as the CSX tracks. The station at 16th Street would have elevators and escalators to provide access from 16th Street

After passing under the Spring Street Bridge, Medium Investment BRT would rise above the level of the existing development south of the CSX right-of-way. East of the Falklands Chase apartments, Medium Investment BRT would cross over the CSX tracks on an aerial structure to enter the SSTC parallel to, but at a higher level than, the existing tracks.

After the SSTC, Medium Investment BRT would leave the CSX right-of-way and follow Bonifant Street at-grade, crossing Georgia Avenue, and just prior to Fenton Street turn north toward Wayne Avenue. The alignment would continue on Wayne Avenue in shared lanes with added left turn lanes to Flower Avenue and then Arliss Street. At Piney Branch Road, the alternative would turn left into dedicated lanes to University Boulevard.

Medium Investment BRT would be in dedicated lanes on University Boulevard with an at-grade crossing of the intersections. The alignment would continue through the UM campus in dedicated lanes on Campus Drive and then continue at-grade in a new exclusive transitway along the intramural fields to US 1.

Crossing US 1 at-grade, Medium Investment BRT would pass through the East Campus development on Rossborough Lane to Paint Branch Parkway. The alignment would continue on Paint Branch Parkway and River Road in shared lanes, as with Low Investment BRT. At Kenilworth Avenue, both lanes would be dedicated.

Turning left on East West Highway, Medium Investment BRT would be in dedicated lanes. As with Low Investment BRT, this alternative would travel in shared lanes on Veterans Parkway.

Medium Investment BRT would continue on Veterans Parkway to Ellin Road, where it would turn left into dedicated lanes to the New Carrollton Metro Station.

Alternative 5: High Investment BRT via Master Plan Alignment

Alternative 5 is intended to provide the most rapid travel time for a BRT Alternative. It would make maximum use of vertical grade separation and horizontal traffic separation. Tunnels and aerial structures are proposed at key locations to improve travel time and reduce delay. When operating within or adjacent to existing roads, this alternative would operate primarily in dedicated lanes. This is the only alternative that would serve the Bethesda Station, both at the existing Bethesda bus terminal at the Metro station and at the new south entrance to the Metro station beneath the Apex Building.

High Investment BRT would follow a one-way loop in Bethesda from the Master Plan alignment onto Pearl Street, then travel west on East West Highway and Old Georgetown Road into the Bethesda Metro Station bus terminal, exit onto Woodmont Avenue southbound, and then continue left under the Air Rights Building to rejoin the Georgetown Branch right-of-way.

Elevators would provide a direct connection to the south end of the Bethesda Metro Station in the tunnel under the Air Rights Building.

The High Investment BRT alignment would be the same as Medium Investment BRT until it reaches the CSX corridor. As with the Low and Medium Investment BRT Alternatives, this alternative would follow the CSX corridor on the south side of the right-of-way, but it would cross 16th Street and Spring Street below the grade of the streets, at approximately the same grade as the CSX tracks. The station at 16th Street would have elevators and escalators to provide access from 16th Street.

The crossing of the CSX right-of-way would be the same as for Medium Investment BRT. From the SSTC, High Investment BRT would continue along the CSX tracks until Silver Spring Avenue, where the alignment would turn east entering a tunnel, passing under Georgia Avenue, and turning north to Wayne Avenue. The alignment would return to the surface on Wayne Avenue near Cedar Street. It would continue on Wayne Avenue in dedicated lanes, crossing Sligo Creek Parkway, and entering a tunnel approximately half-way between Sligo Creek and Flower Avenue, then turning east to pass under Plymouth Street, crossing under Flower Avenue, and emerging from the tunnel on Arliss Street.

High Investment BRT would be the same on Piney Branch Road and University Boulevard except that the alignment would have grade-separated crossings over New Hampshire Avenue and Riggs Road.

Approaching UM, the alignment would cross under Adelphi Road. After Adelphi Road, the alignment would follow Campus Drive and turn onto the proposed Union Drive extended. The alignment would enter a tunnel while on Union Drive, prior to Cole Field House, and pass through the campus under Campus Drive. After emerging from the tunnel east of Regents Drive, the alignment would be the same as Medium Investment BRT, until Paint Branch Parkway.

The alignment would continue east on Paint Branch Parkway in dedicated lanes, except under the CSX overpass, to the College Park Metro Station. The alternative would then follow River Road in dedicated lanes. The alignment would be dedicated on these roadways, except under the CSX Bridge on Paint Branch Parkway.

From River Road (also in dedicated lanes) near Haig Drive, the alignment would turn right and enter a tunnel heading south, roughly parallel to Kenilworth Avenue. Near East West Highway, the alignment would turn left and continue in the tunnel under Anacostia River Park. The alignment would transition to a surface alignment west of the Kenilworth Avenue/East West Highway intersection. The alternative would follow East West Highway in dedicated lanes.

High Investment BRT would turn right down Veterans Parkway in dedicated lanes. Unlike Medium Investment BRT, this alignment would cross under Annapolis Road before continuing on to Ellin Road.

Alternative 6: Low Investment LRT

The Low Investment LRT Alternative would operate in shared and dedicated lanes with minimal use of vertical grade separation and horizontal traffic separation. All LRT Alternatives would serve only the south entrance of the Bethesda Station and would operate there in a stub-end platform arrangement.

Low Investment LRT would begin on the Georgetown Branch right-of-way near the Bethesda Metro Station under the Air Rights Building. The hiker-biker trail connection to the Capital Crescent Trail would not be through the tunnel under the Air Rights Building, but rather through Elm Street Park on existing streets. The terminal station would be the Bethesda Metro Station with a connection to the southern end of the existing station platform.

After emerging from under the Air Rights Building, the transitway would follow the Georgetown Branch right-of-way, crossing Connecticut Avenue at-grade and crossing under Jones Mill Road. Between approximately Pearl Street and just west of Jones Mill Road, the trail would be on the north side of the transitway; elsewhere it would be on the south side.

The segment from Jones Mill Road to Spring Street in the CSX corridor would be the same as for Low and Medium Investment BRT.

After crossing Spring Street, Low Investment LRT would be the same as the Medium and High Investment BRT Alternatives.

Low Investment LRT would be the same as Medium Investment BRT from the SSTC to Bonifant Street to Wayne Avenue.

Turning right, Low Investment LRT would continue at-grade on Wayne Avenue in shared lanes, crossing Sligo Creek Parkway and entering a tunnel from Wayne Avenue to pass under Plymouth Street. As with High Investment BRT, the alignment emerges from the tunnel on Arliss Street.

The Low Investment LRT Alternative would then follow Piney Branch Road and University Boulevard at-grade in dedicated lanes. In keeping with the low investment definition of this alternative, the major intersections of New Hampshire Avenue and Riggs Road would not be grade-separated.

As this alternative approaches Adelphi Road, the grade of the existing roadway is too steep for the type of LRT vehicles being considered. For this reason, the transitway would cross the intersection below grade.

At Adelphi Road, the alignment would enter the UM campus on Campus Drive. The alignment would follow the same alignment to the College Park Metro Station as described for Medium Investment BRT.

From the College Park Metro Station to the terminus at the New Carrollton Metro Station, Low Investment LRT would be in dedicated lanes on River Road. On Kenilworth Avenue, the LRT would be in a dedicated lane southbound, but a shared lane northbound. On East West Highway, the LRT would be in dedicated lanes with shared left turn lanes and in shared lanes under Baltimore-Washington Parkway. On Veterans Parkway, the LRT is in dedicated lanes.

As with Low Investment BRT, this alignment turns left on Annapolis Road from Veterans Parkway and then right on Harkins Road to the New Carrollton Metro Station. The segments on Annapolis Road and Harkins Lane would be dedicated.

Alternative 7: Medium Investment LRT

Medium Investment LRT is the same as Low Investment LRT from Bethesda to the CSX corridor, except that the alignment would cross over Connecticut Avenue.

Along the CSX corridor, the alignment would be the same as High Investment BRT, grade-separated (below) at 16th and Spring Streets. The alignment would be the same as Medium and High Investment BRT and Low Investment LRT from Spring Street through the SSTC.

From the SSTC, the alignment would follow Bonifant Street in dedicated lanes to Wayne Avenue. On Wayne Avenue, this alterative would be in shared lanes with added left turn lanes. The alignment would be the same as Low Investment LRT until Paint Branch Parkway, where it would be in dedicated lanes, except under the CSX/metro tracks at the College Park Metro Station, except for Paint Branch Parkway where it would be in dedicated lanes. The LRT follows River Road, Kenilworth Avenue, East West Highway, and Veterans Parkway in dedicated lanes. At the intersection of Veterans Parkway and Annapolis Road the LRT continues across Annapolis, turning left at Ellin Road still in dedicated lanes.

Alternative 8: High Investment LRT

Alternative 8, High Investment LRT, would be the same as the High Investment BRT Alternative, except for the Bethesda terminus. The alignment would begin just west of the tunnel under the Air Rights Building. The hiker-biker trail would follow the alignment through the tunnel under the Air Rights Building. Because of physical constraints, the trail would be elevated above the westbound tracks. The trail would return to grade as it approaches Woodmont Avenue. The terminal station would be the Bethesda Metro Station with a connection to the southern end of the existing station platform.

1.2.4. Design Options

North Side of CSX

This design option is based on the Georgetown Branch Master Plan. From the eastern end of the Georgetown Branch right-of-way, the alignment would cross under the CSX corridor and then continue down the north side. It would emerge from the tunnel near Lyttonsville Road in Woodside. The alignment would be below the grade of 16th Street, passing under the bridge, but providing a station at that location. It would also pass under the Spring Street Bridge but would begin to rise on an aerial structure over the CSX right-of-way 1,000 feet northwest of Colesville

Road due to the location of the Metro Plaza Building. The aerial structure over the CSX right-of-way would provide the required 23-foot clearance from top of rail to bottom of structure. The alternative would enter the SSTC parallel to, but at a higher level than, the existing tracks.

South Side of CSX with a Crossing West of the Falklands Chase Apartments

This option would operate on the south side of the CSX, as described either at or below grade at 16th Street. The alignment would cross the CSX corridor between Spring Street and Fenwick Lane. This option would continue along the north side of the CSX right-of-way on an aerial structure over the CSX right-of-way 1,000 feet northwest of Colesville Road, due to the location of the Metro Plaza building. The aerial structure over the CSX right-of-way would provide the required 23-foot clearance from top of rail to bottom of structure. The alternative would enter the SSTC parallel to, but at a higher level than, the existing tracks.

Silver Spring/Thayer Tunnel

This design option would begin at the SSTC where the alignment leaves the CSX corridor near Silver Spring Avenue. It would enter a tunnel on Silver Spring Avenue passing under Georgia Avenue and Fenton Street. At approximately Grove Street, the alignment would shift northward to continue under the storm drain easement and backyards of homes on Thayer and Silver Spring Avenues. The transitway would emerge from the tunnel behind the East Silver Spring Elementary School on Thayer Avenue and follow Thayer Avenue across Dale Drive to Piney Branch Road. If the mode selected were LRT, the grade of Piney Branch Road would require an aerial structure from west of Sligo Creek and Sligo Creek Parkway and would return to grade just west of Flower Avenue. This aerial structure requires that the road be widened. For this design option, a station would be located on Thayer Avenue where the alignment would emerge from the tunnel.

UM Campus via Preinkert Drive

Preinkert Drive is being evaluated as a design option for both BRT and LRT through the campus of UM. The alignment would run from the west on Campus Drive turning right onto Preinkert Drive where it would head southeast. The transitway would turn left to pass directly between LeFrak Hall and the South Dining Campus Hall and then northeast through the Lot Y parking lot. From there, the alignment would run east along Chapel Drive between Memorial Chapel and Marie Mount Hall and eventually would pass to the south of Lee Building at Chapel Fields. The alignment would continue onto Rossborough Lane, passing directly north of Rossborough Inn to cross US 1, and continues east through the East Campus development.

1.2.5. Stations and Station Facilities

Between 20 and 21 stations are being considered for each of the alternatives. **Table 1-1** provides the stations for each of the Build Alternatives.

Table 1-1: Stations by Alternative

Segment Name	Low Invest. BRT	Medium Invest. BRT	High Invest. BRT	Low Invest. LRT	Medium Invest. LRT	High Invest. LRT
Bethesda Metro, North Entrance	Yes	Yes	Yes	**N/A**	**N/A**	**N/A**
Medical Center Metro	Yes	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Bethesda Metro, South Entrance	**N/A**	Yes	Yes	Yes	Yes	Yes
Connecticut Avenue	Yes	Yes	Yes	Yes	Yes	Yes
Lyttonsville	Yes	Yes	Yes	Yes	Yes	Yes
Woodside/16th Street	Yes	Yes	Yes	Yes	Yes	Yes
Silver Spring Transit Center	Yes	Yes	Yes	Yes	Yes	Yes
Fenton Street	Yes	Yes	**N/A**	Yes	Yes	**N/A**
Dale Drive	Yes	Yes	Yes	Yes	Yes	Yes
Manchester Place	Yes	Yes	Yes	Yes	Yes	Yes
Arliss Street	Yes	Yes	Yes	Yes	Yes	Yes
Gilbert Street	Yes	Yes	Yes	Yes	Yes	Yes
Takoma/Langley Transit Center	Yes	Yes	Yes	Yes	Yes	Yes
Riggs Road	Yes	Yes	Yes	Yes	Yes	Yes
Adelphi Road	Yes	Yes	Yes	Yes	Yes	Yes
UM Campus Center	Yes	Yes	Yes	Yes	Yes	Yes
US 1	Yes	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
East Campus	**N/A**	Yes	Yes	Yes	Yes	Yes
College Park Metro	Yes	Yes	Yes	Yes	Yes	Yes
River Road	Yes	Yes	Yes	Yes	Yes	Yes
Riverdale Park	Yes	Yes	Yes	Yes	Yes	Yes
Riverdale Heights	Yes	Yes	Yes	Yes	Yes	Yes
Annapolis Road	Yes	Yes	Yes	Yes	Yes	Yes
New Carrollton Metro	Yes	Yes	Yes	Yes	Yes	Yes

The design of the Purple Line stations has not been determined at this stage of the project; however, the stations would likely include the following elements: shelters, ticket vending machines, seating, and electronic schedule information. The stations would be located along the transitway and would be on local sidewalks or in the median of the streets, depending on the location of the transitway. Because both the BRT and LRT vehicles under consideration are "low floor," the platforms would be about 14 inches above the height of the roadway. The platforms would be approximately 200 feet long and between 10 and 15 feet wide, depending on the anticipated level of ridership at each particular station. No new parking facilities would be constructed as part of the Purple Line. Municipal parking garages exist near the Bethesda and Silver Spring Metro Stations, and transit parking facilities exist at the College Park and New Carrollton Metro Stations.

Additional kiss-and-ride facilities would be considered at the stations at Connecticut Avenue on the Georgetown Branch right-of-way and Lyttonsville. The SSTC, College Park Metro Station, and New Carrollton Metro Station already have kiss-and-ride parking facilities available and the Purple Line would not add more. It has been determined that kiss-and-ride facilities are not needed at the Takoma/Langley Transit Center.

1.2.6. Maintenance and Storage Facilities

LRT and BRT both require maintenance and storage facilities; however, the requirements in terms of location and size are not the same. LRT requires a facility located along the right-of-way while a BRT facility can be located elsewhere. Depending on the construction phasing and mode chosen, two maintenance facilities (one in Montgomery County and one in Prince George's County) are ideal.

The size of the facility depends on the number of vehicles required. A fleet of 40 to 45 vehicles (including spares) would require approximately 20 acres. The Purple Line would also require storage for non-revenue vehicles and equipment such as: maintenance, supervisory, and security vehicles.

Activities at the maintenance facility would include:

- Vehicle storage area (tracks for LRT)
- Inspection/cleaning
- Running repairs
- Maintenance/repair
- Operations/security
- Parking
- Materials/equipment storage

Two sites improve operations by providing services and storage near the ends of the alignment. It is possible to have one site provide the majority of the services and the other function as an auxiliary site.

Six potential sites were identified during the course of the alternatives analysis, and five of these were evaluated for environmental impacts. As part of the screening process three were eliminated from further consideration. These five sites are listed below:

- Lyttonsville – This is a maintenance facility on Brookville Road in Lyttonsville, currently used by Montgomery County Ride On buses and school buses. The Purple Line would require the use of some additional adjacent property.
- Haig Court – This site is located on River Road at Haig Court. It would require minimal grading, but is partly wooded and is very close to the residential neighborhood of Riverdale, which is also a historic district.

- North Veterans Parkway – This site is located on the north side of Veterans Parkway. This site is heavily wooded and includes steep grades.
- Glenridge Maintenance Facility – This site is located on the south side of Veterans Parkway near West Lanham Shopping Center. It is currently used as a maintenance facility for Prince George's County Park vehicles.
- MTA New Carrollton property – This site located on the east side of the New Carrollton Metro Station and is owned but the MTA. It is not particularly well located for use by the Purple Line because it would require the Purple Line to pass under or around the New Carrollton Metro Station.

1.2.7. Traction Power Substations

Light rail's electric traction power system requires electrical substations approximately every 1.25 miles depending on the frequency and size of the vehicles. These substations, which are approximately 10 feet by 40 feet, do not need to be immediately adjacent to the tracks. This flexibility means the substations can be located to minimize visual intrusions and can be visually shielded by fencing, landscaping, or walls, or can be incorporated into existing buildings. The number and location of these substations will be determined during the preliminary engineering phase of project development.

2. Existing Conditions and Effects

2.1. Topography, Geology, and Soils

2.1.1. Topography

Methods

United States Geological Survey (USGS) and Maryland Geological Survey (MGS) topographic maps were reviewed to obtain information on the topography in the corridor.

Existing Conditions

The corridor generally transitions from the gently rolling Piedmont in the west to the gently rolling areas of the Coastal Plain in the east. Elevations generally range from 28 to 335 feet above sea level, with the highest elevations occurring in the western portion of the corridor and the lowest elevations occurring near the tributaries of the Anacostia River. Much of the topographic landscape has been manipulated for development, such as filling of historic wetlands along streams, raised berms for highways, and grading of topographic relief for the urban street grid.

Effects

Topographic effects from any of the Purple Line Build Alternatives and their design options are expected to be minimal. The topographic landscape within the corridor has been heavily manipulated for construction of streets and buildings. The alternatives will either maintain the existing topography, as most of the alternatives occur within the existing roadway, or require grading that would amount to a relatively small incremental change to the existing topography. Changes to topography would occur primarily from the reconfiguring of existing roadways to support aerial crossings, tunneling options, widening the existing road berm to accommodate the transit guideway, or the relocation of the Capital Crescent Trail within the right-of-way. Of the Build Alternatives, Low Investment BRT has the fewest constructed elements, making it the Build Alternative with the least effect to topography. Of the remaining alternatives, the least long-term changes in surface topography would occur with High Investment BRT and LRT. These alternatives include the most extensive tunnel components, which would be either cut and cover tunnels or deep tunnels that would be constructed using underground boring machines. Most changes in surface topography that might occur near tunnel portals during construction would be temporary, as existing grades would be re-established following construction.

A majority of the maintenance and storage facility sites will require minimal grading, except for the North Veterans Parkway site and the Glenridge maintenance facility. Both sites are located along steep hillsides that would require significant grading and fill to accommodate the infrastructure of a maintenance and storage facility. The topographic reconfiguration of this area could permanently alter the hydrology of existing streams and wetlands occurring just down-slope of the proposed maintenance and storage facility sites. Proper sediment and erosion

control measures would be in place during construction to reduce further alteration of natural drainage patterns and the hydrology of adjacent wetlands and streams.

2.1.2. Geology

Methods

Geologic information was obtained from the Geological Map of Maryland (MGS 1968).

Existing Conditions

A physiographic province is a landform region that has been shaped by similar geologic history and is characterized by similar elevation, relief, climate, and geologic structure. The corridor is underlain by two physiographic provinces. The Piedmont Province consists of hard, crystalline igneous and metamorphic rocks, extending from the western limits of the corridor east to the Coastal Plain Province. The transition between the Coastal Plain and Piedmont, known as the fall zone, crosses the corridor from southwest to northeast, immediately east of Colesville Road. Coastal Plain geology is characterized by unconsolidated sediments that include clay, gravel, sand, and silt.

The western portion of the corridor traverses the Lower Pelitic Schist formation, which is medium to coarse grained biotite-oligoclase-muscovite-quartz schist, as shown in **Figure 2-1**. It has an apparent thickness of 5,500 feet and was formerly identified as oligoclase facies of the Wissahickon Formation. A thin band of Kensington Quartz Diorite runs perpendicular through the corridor, primarily within Rock Creek Stream Valley Park The Boulder Gneiss Formation, which was formerly known as the Sykesville and Laurel Formations, comprises a large portion of Silver Spring. This formation is typically medium-grained, thick-bedded to massive, pebble and boulder-bearing gneiss. It has an apparent thickness of 15,000 feet, which is locally intensively foliated.

The Coastal Plain Province portion of the corridor consists of two formations, the Potomac Group and the Lowland Deposits, as shown in **Figure 2-1**. The Potomac Group, comprising a majority of the corridor, is a combination of interbedded gravel, sand, silt, and clay with a thickness of zero to 800 feet. The Lowland Deposits occur along the Anacostia River and smaller project-area streams such as Sligo Creek, Northwest Branch, Paint Branch, and Indian Creek. This formation is comprised of clay, gravel, and sand and has an overall thickness of zero to 150 feet.

Effects

Effects on corridor geology would be greatest for the alternatives that include tunnel options (High Investment BRT and all LRT Alternatives). Alternatives and maintenance and storage facility sites that involve only surface construction would have little or no effect on this resource. All of the tunnel options have the potential to affect a change in the geologic resources in the corridor, though these changes would be limited to the tunnel section itself where rock or Coastal Plain deposits would be bored and removed to allow for construction of the tunnel. The Silver Spring/Thayer design option and the tunnel to Wayne Avenue would impact the Boulder Gneiss

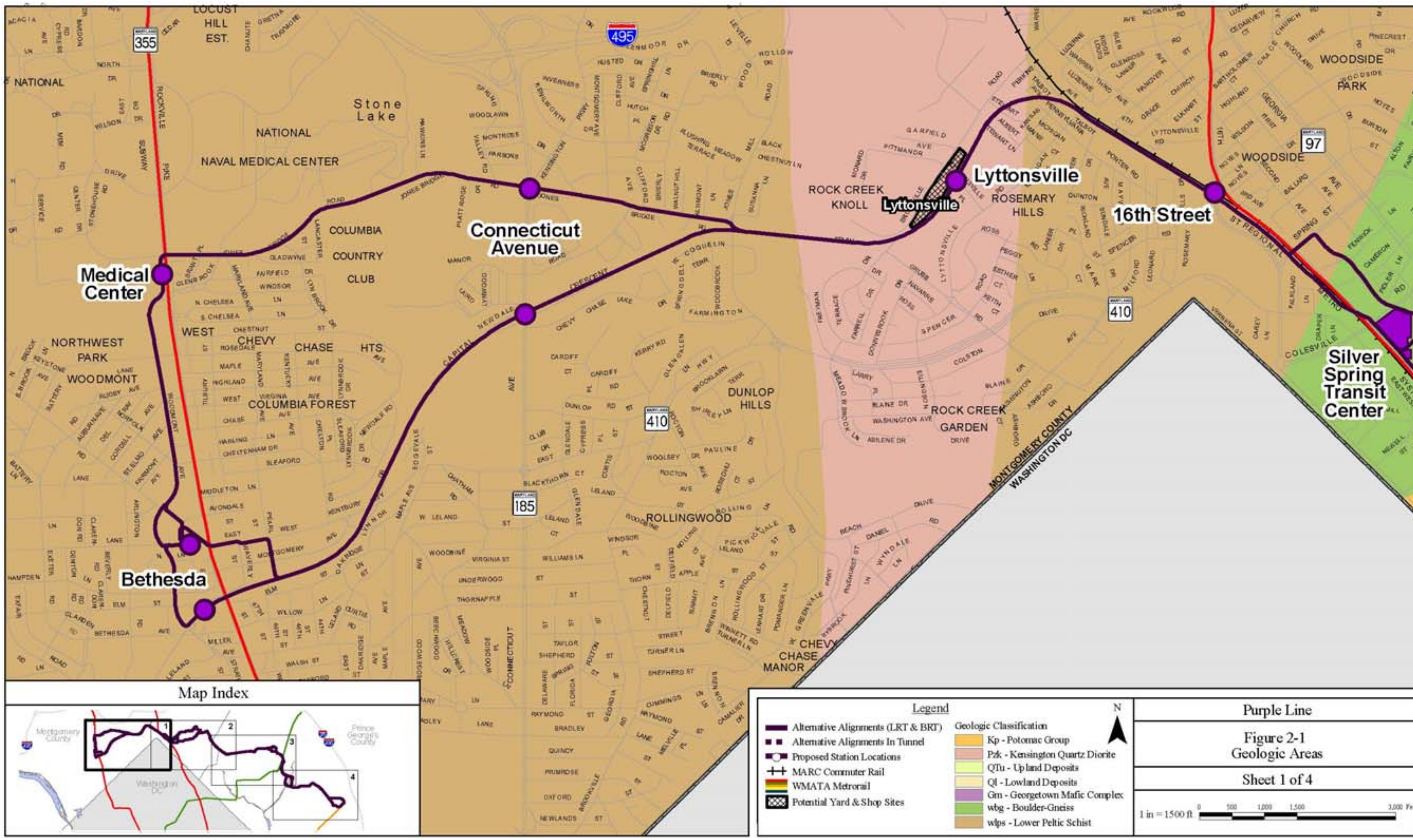

Figure 2-1: Purple Line Geologic Areas

Purple Line

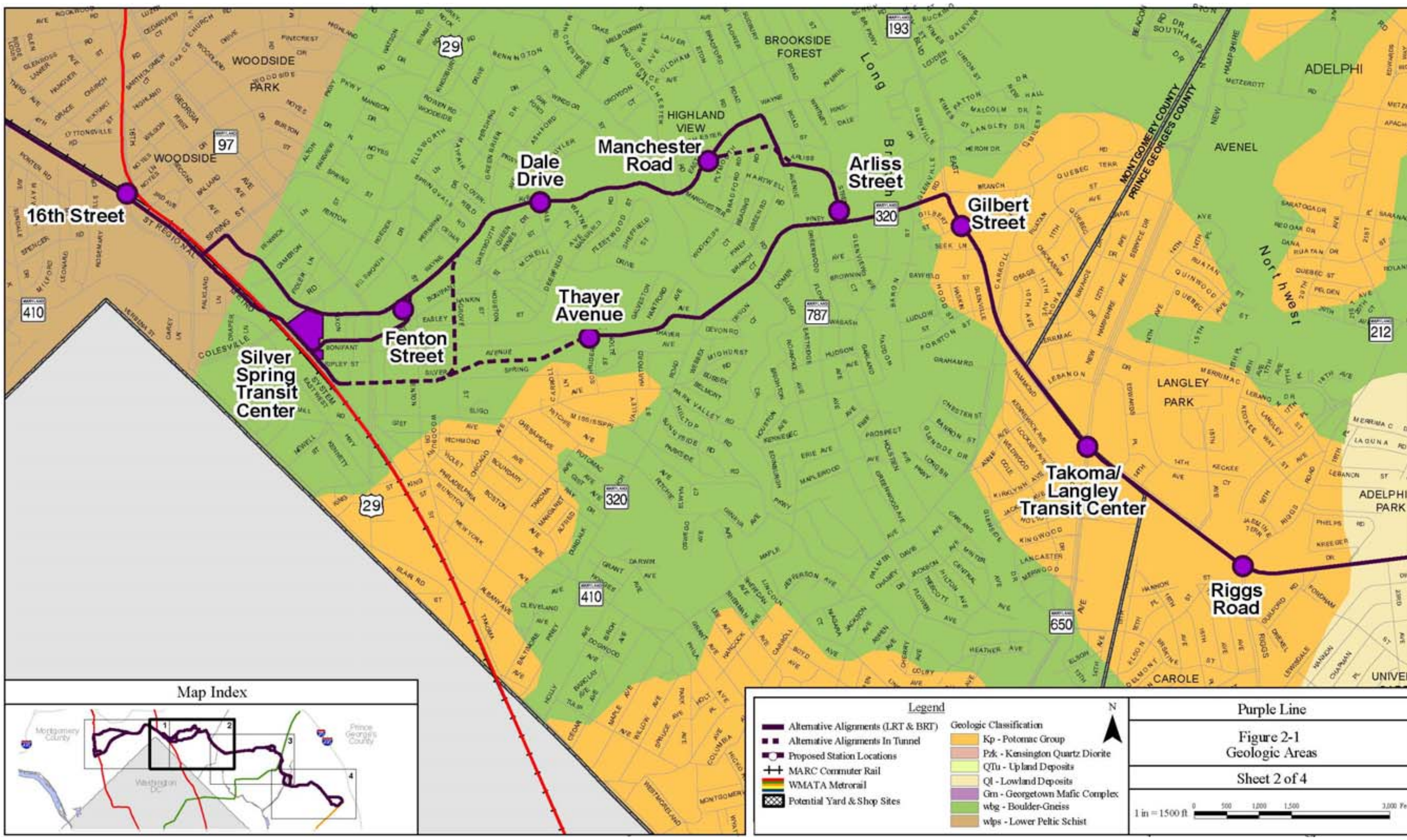

Figure 2-1: Purple Line Geologic Areas (continued)

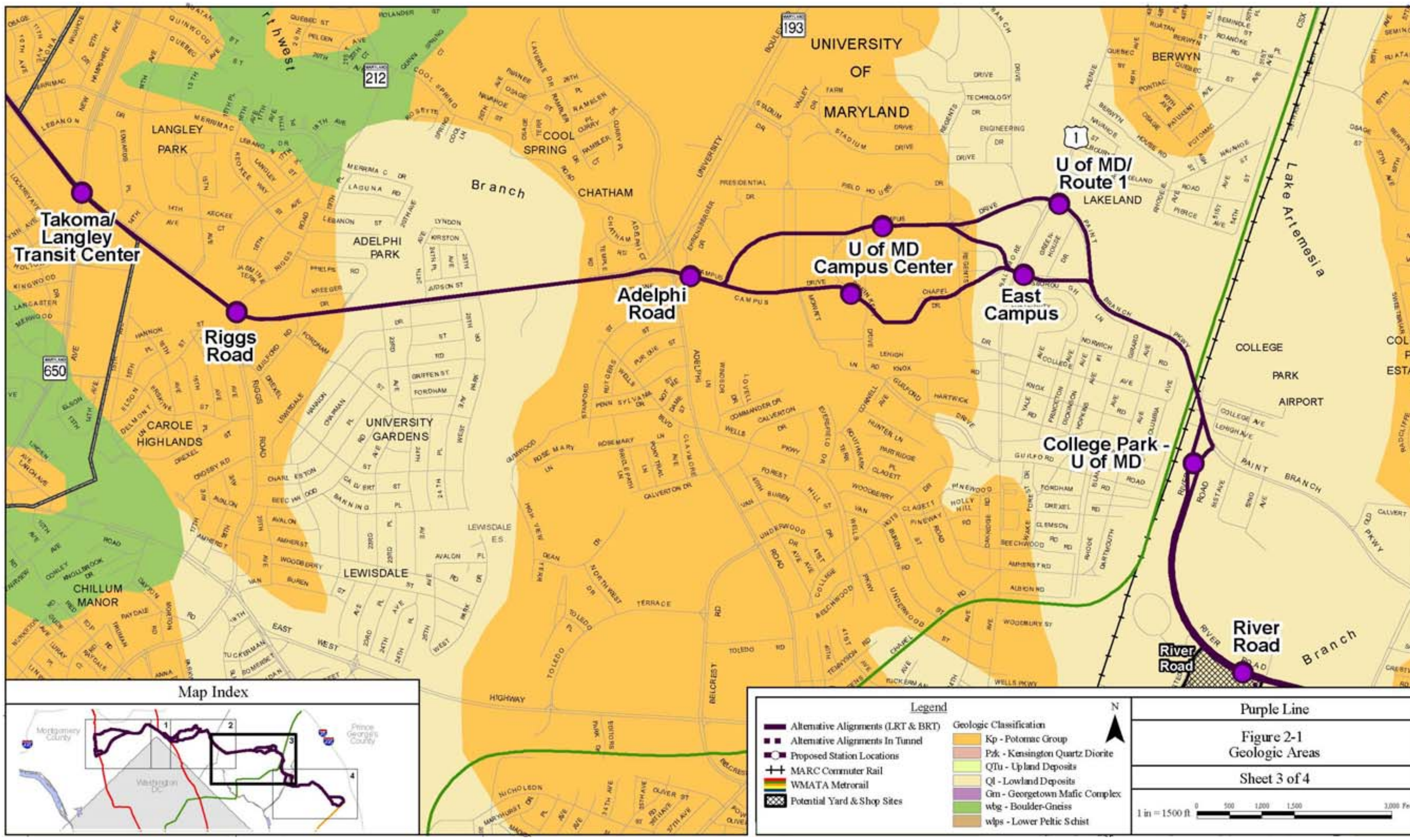

Figure 2-1: Purple Line Geologic Areas (continued)

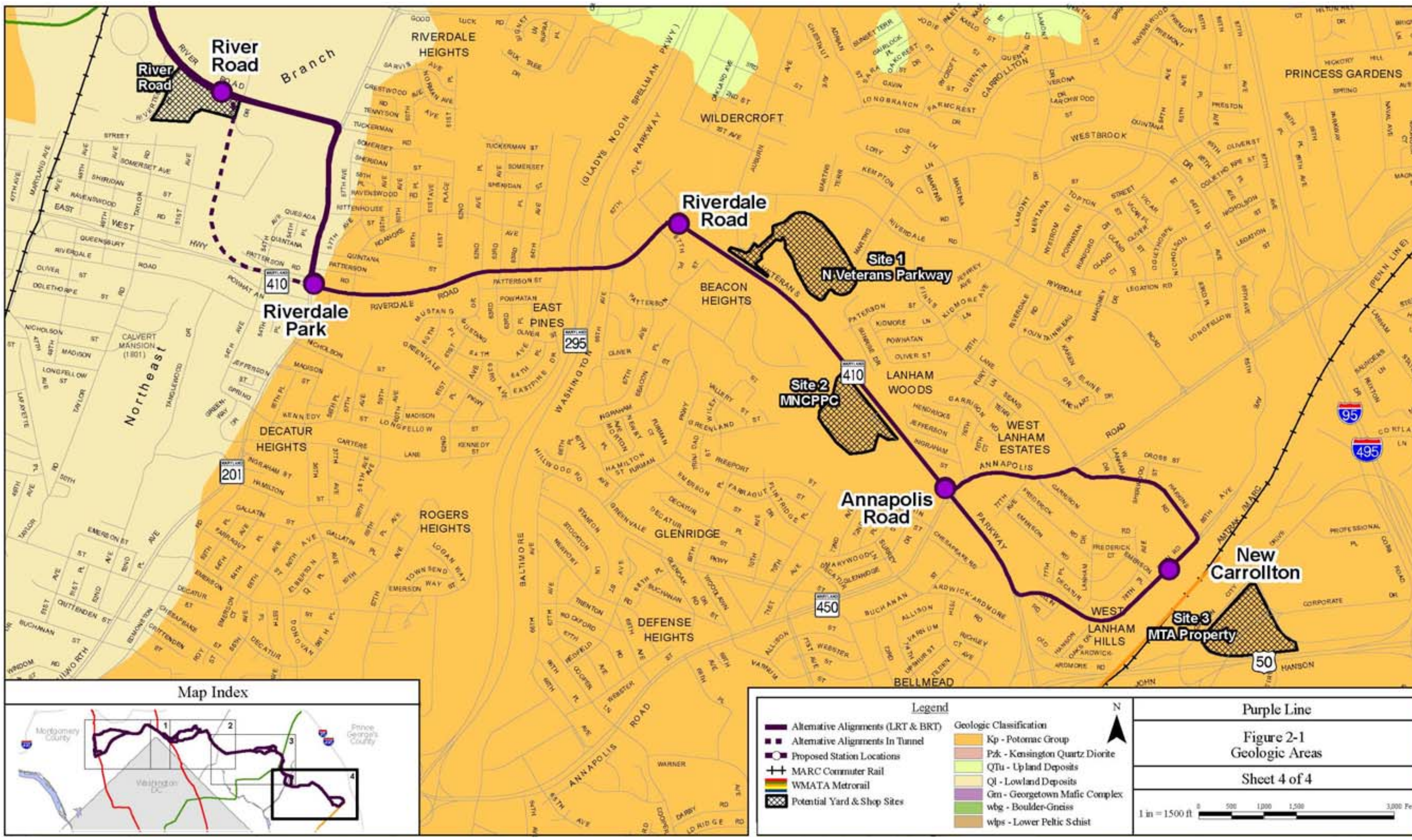

Figure 2-1: Purple Line Geologic Areas (continued)

Formation in Silver Spring. Very thick boulder and rock substrate is most likely to be encountered with these tunnel options. The tunnel from River Road to East West Highway would impact the lowland deposits of the Coastal Plain province. The long tunnel under Campus Drive would impact the Potomac Group Formation and the lowland deposits of the Coastal Plain.

If an alternative with tunnels is selected, detailed geotechnical investigations would be undertaken in later phases of the project to determine the specific nature of the geologic formations within the tunnel sections. This information would be utilized for design of the tunnel sections and for development of construction techniques tailored to the specific geologic conditions in the corridor. Investigations would also include testing for contaminants that could affect construction safety and/or that would require remediation if disturbed.

2.1.3. Soils

Methods

Soil information was obtained from the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Montgomery County Soil Survey (USDA 1995) and the Prince George's County Soil Survey (USDA 1967). Hydric soil information was obtained from the NRCS hydric soils list for Montgomery and Prince George's Counties. The county lists for prime farmland and soils of statewide importance were obtained from the USDA-NRCS Soil Data Mart (USDA 2007).

Existing Conditions

As illustrated in **Figure 2-2**, six soil associations occur within the corridor. Montgomery County contains two of these soil associations: the Urban Land-Wheaton-Glenelg association and the Glenelg-Gaila-Occoquan association. Prince George's County contains the remaining four soil associations: the Manor-Glenelg association, the Beltsville-Leonardtown-Chillum association, the Christiana-Sunnyside-Beltsville association, and the Bibb-Tidal association.

Montgomery County

The Urban Land-Wheaton-Glenelg association occurs mainly in the southeastern portion of Montgomery County and along ridge tops. This association contains soils that are very deep and loamy throughout. These soils are well-drained Urban Land that is nearly level to strongly sloping. This association is approximately 40 percent Urban Land series, 18 percent Wheaton series, 12 percent Glenelg series, and 30 percent minor soil series.

A narrow corridor of the Glenelg-Gaila-Occoquan association occurs east of University Boulevard. These deep to very deep soils are loamy throughout and occur in well-drained uplands. This association is approximately 51 percent Glenelg, 21 percent Gaila, 7 percent Occoquan, and 21 percent soils of minor extent. This association occupies approximately 41 percent of the county.

Prince George's County

A small portion of the Manor-Glenelg association occurs in the portion of the corridor that is roughly bordered by University Boulevard to the north, East West Highway to the south, and Riggs Road to the east. These soils are well-drained to somewhat excessively drained, and are nearly level to very steep. This association is approximately 75 percent Manor, while the Glenelg and minor soil series occupy the remaining 25 percent.

The Beltsville-Leonardtown-Chillum association is a small component of the corridor that is bordered by the Washington, D.C. boundary to the south, the Montgomery County line to the west, East West Highway to the north, and Riggs Road to the south. These soils are gently sloping, have compact subsoils, and range from well-drained to poorly drained. This association is approximately 45 percent Beltsville and 13 percent Leonardtown. The Chillum and minor soil series represent the remaining 42 percent. This association occupies approximately 16 percent of the county.

The Christiana-Sunnyside-Beltsville association is located in the northwest portion of the county. It extends north from the Washington, D.C. boundary to the Patuxent River. These deep, sandy and clayey soils have compact subsoils and occur in areas ranging from level to steep slopes. Soils in this association are well-drained to moderately well-drained. This association is approximately 26 percent Christiana, 20 percent Sunnyside, 20 percent Beltsville, and 34 percent minor soils. This association occupies approximately 15 percent of the county.

The Bibb-Tidal association occurs in the corridor along the banks of the tributaries to the Northwest Branch. These soils are subject to tidal flooding from streams and are poorly drained soils within marshes and floodplains. These floodplain soils occupy approximately 82 percent of the association, and minor soils occupy the remaining 18 percent. The association accounts for about 11 percent of the county's soils.

Within these broad associations in the corridor, there are 70 soil mapping units as exhibited in Appendix A. Montgomery County has 13 soil mapping units and Prince George's County has 57. Soil mapping units and their significant characteristics are summarized in the soils table in Appendix A.

Hydric Soils

A hydric soil is defined by NRCS as a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part of the soil profile. These soils are wet enough to support the growth and regeneration of hydrophytic vegetation. Seven hydric soils were identified in the corridor: Hatboro silt loam, Bibb silt loam, Bibb-Urban Land complex, Elkton silt loam, Fallsington sandy loam, Fallsington-Urban Land complex, and Leonardtown silt loam. Hydric soils within the corridor are listed in the soils table in Appendix A.

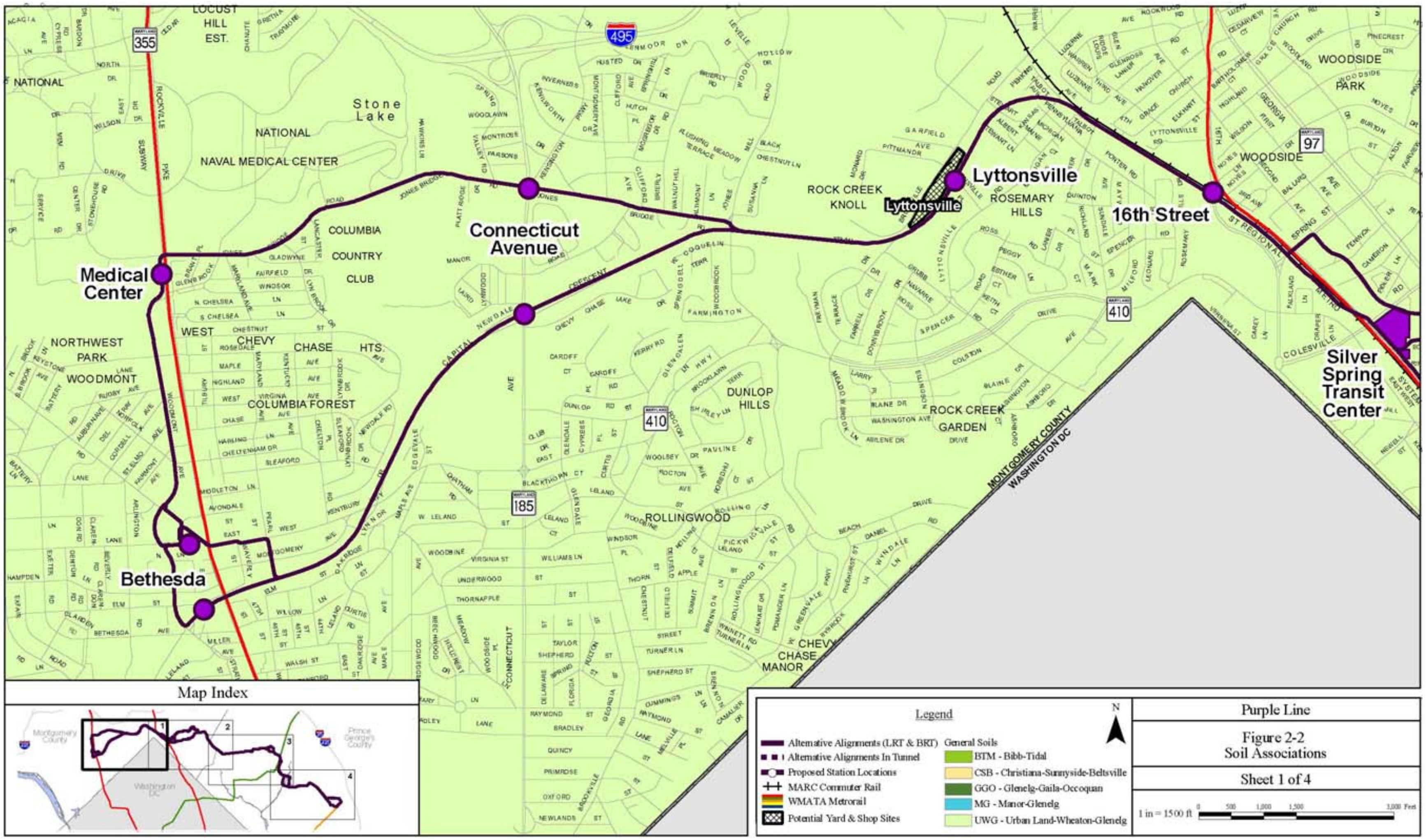

Figure 2-2: Purple Line Soil Associations

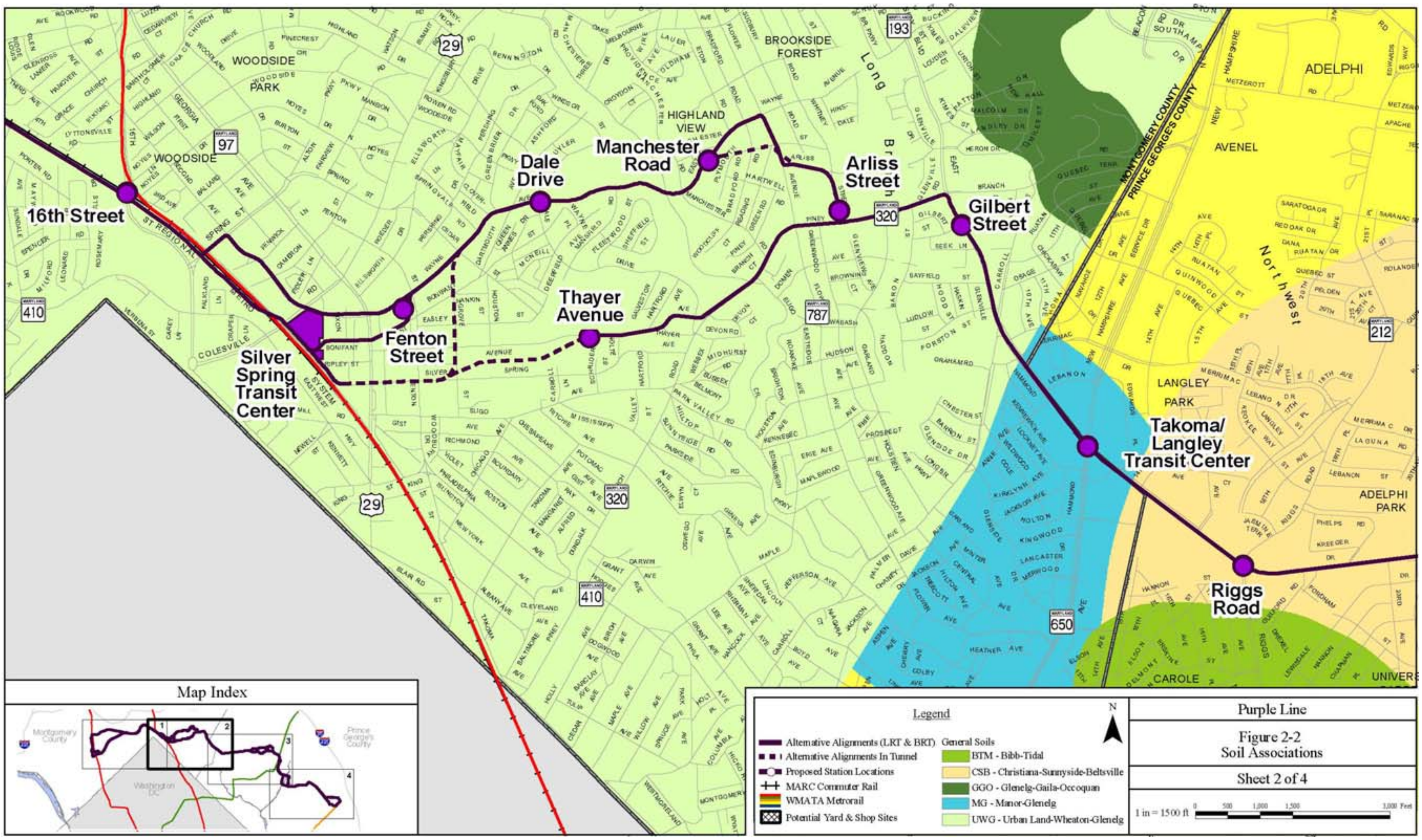

Figure 2-2: Purple Line Soil Associations (continued)

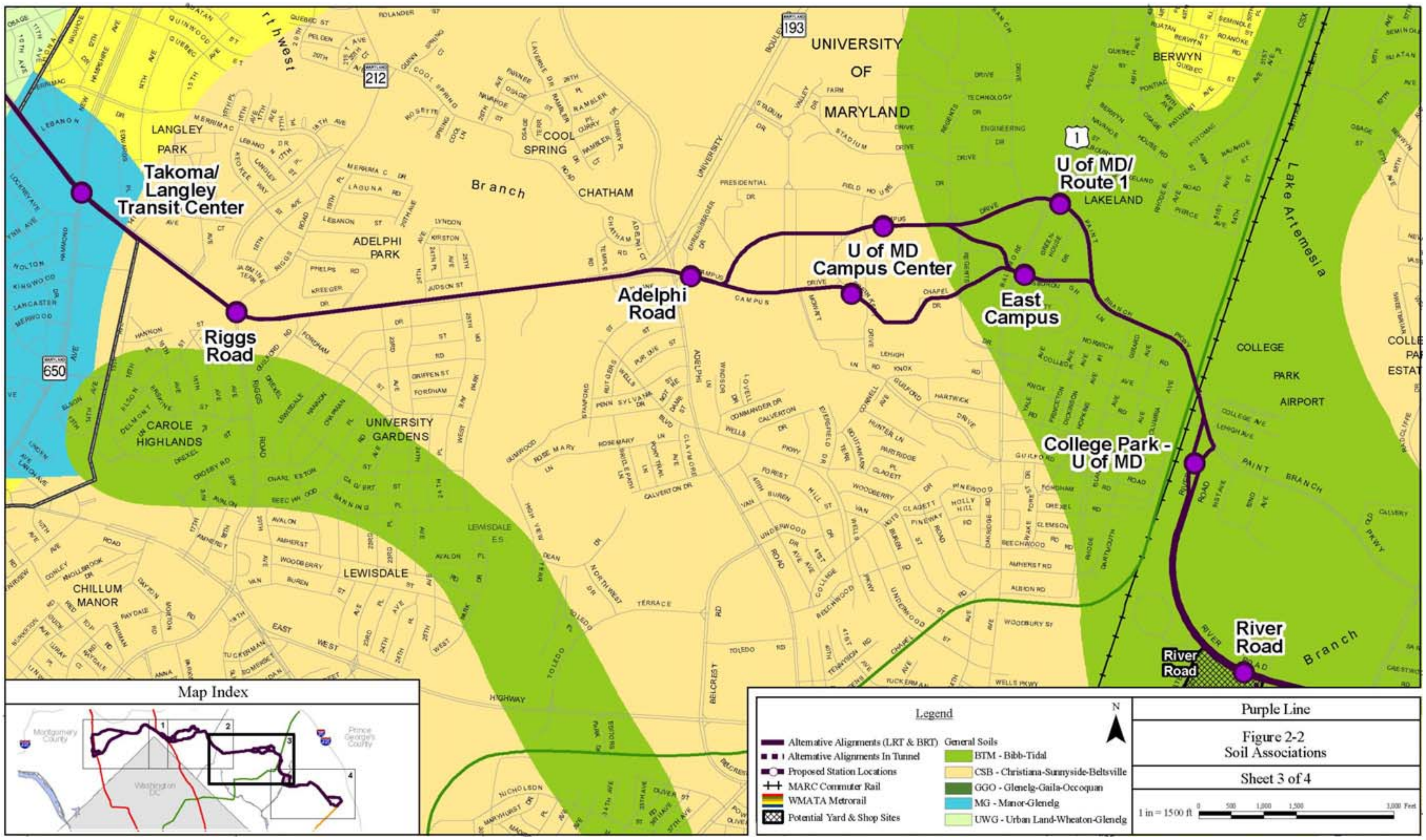

Figure 2-2: Purple Line Soil Associations (continued)

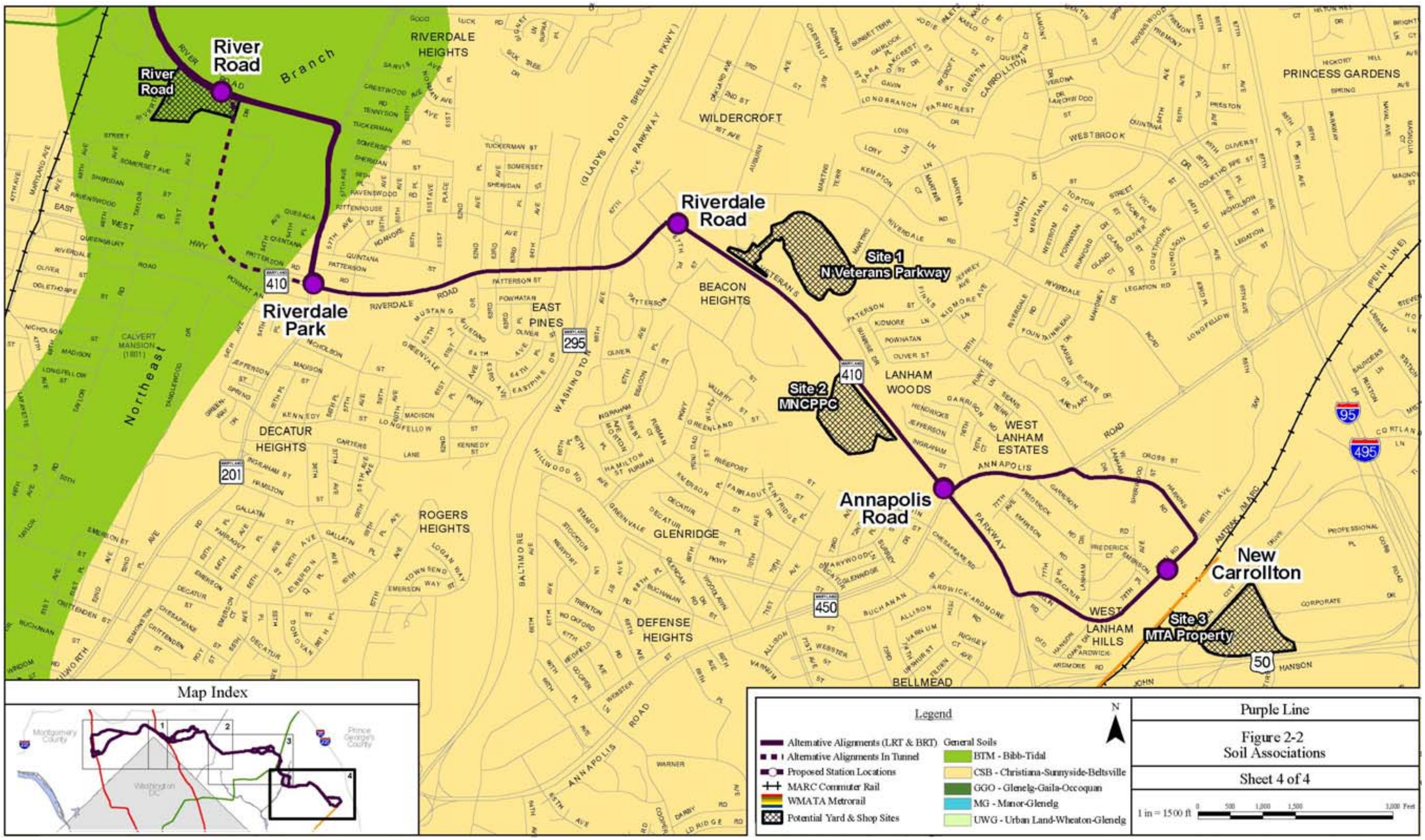

Figure 2-2: Purple Line Soil Associations (continued)

Highly Erodible Land

In the corridor, 24 soil types are classified as highly erodible land. Highly erodible land is susceptible to the erosive forces of wind and water. Soils found in the corridor that are considered highly erodible land are listed in Appendix A and illustrated in **Figure 2-3**.

Prime Farmland Soils and Soils of Statewide Importance

Prime farmland is soil that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. Typically these lands do not flood frequently or are protected from flooding. They receive an adequate water supply from irrigation or precipitation and are permeable to water and air (USDA 2007).

Soils of statewide importance include land, in addition to prime farmlands, that is of statewide importance for the production of food, feed, fiber, forage, and oilseed crops. In general, additional farmlands of statewide importance include those that are nearly prime farmland and that produce high yields of cash crops or livestock feed when treated and managed according to conventional farming methods. Prime farmland soils and soils of statewide importance within the corridor are listed in Appendix A.

Effects

Due to the urbanized nature of the corridor, the majority of the soils potentially affected by the project have already been disturbed, manipulated, or covered by development. Additional soil disturbances will occur for all of the Build Alternatives and maintenance and storage facility sites due to grading for the proposed Build Alternatives and their associated components. However, in most cases, project-induced changes to the existing nature of the soils would be compatible with existing and surrounding conditions. Other potential impacts that could occur with any of the Build Alternatives, depending on the level of earthmoving required, include changes to drainage patterns within or adjacent to the right-of-way. These changes would be associated with redirecting surface runoff and localized changes in shallow groundwater movement. However, these effects should be minimal and reduced by required stormwater management (SWM) facilities.

Soils in the corridor generally have characteristics that will need to be addressed as part of the later design and construction of any Build Alternative. As detailed in Appendix A, many of the soil types have moderate to severe limitations for construction due to instability, seasonally high water tables, and a tendency to shrink and/or swell. In addition, the majority of the soils in the corridor are classified as highly erodible.

These characteristics would be evaluated in detail during later phases of the project, should a Build Alternative be selected. Detailed geotechnical investigations would be conducted to determine specific soil characteristics along the selected alternative so that construction techniques and environmental safeguards could be developed to address limitations. To minimize potential effects from soil disturbances, proper slope and soil stabilization techniques would be used in work areas, both during and after construction, to prevent potential

sedimentation of nearby waterways. Sediment and erosion controls and SWM facilities would be implemented in the corridor in accordance with the Maryland Department of Environment (MDE) *2000 Maryland Stormwater Design Manual, Volumes I & II* (MDE 2000).

Highly Erodible Land

The impacts to highly erodible soils for all of the Build Alternatives and respective segments are shown in **Table 2-1**. High Investment BRT with the Silver Spring/Thayer design option would have the highest potential impact (86.60 acres) to highly erodible soils, while Low Investment BRT would have the least amount of impact (70.83 acres). Most of the maintenance and storage facility sites, except the Haig Court Site, would impact highly erodible soils. Site 1 would have the highest impact (21.73 acres), while Site 5 would have the least impact (0.09 acres) as shown in **Table 2-2**. Site 4 would have no impacts to highly erodible soils. If precautions are not taken during construction, highly erodible soils can be washed into nearby streams, resulting in stream channel destabilization, increased flooding, and loss of aquatic habitat. Implementing sediment and erosion control measures such as vegetative stabilization, silt fences, and sediment traps can minimize these potential soil erosion impacts.

Table 2-1: Highly Erodible Soils Impacted by the LRT and BRT Alternatives (Acres)

Low Invest. BRT	Medium Invest. BRT	Medium Invest. BRT w/ Preinkert Drive	High Invest. BRT	High Invest. BRT w/ Thayer Option	Low Invest. LRT	Medium Invest. LRT	Medium Invest. LRT w/ Preinkert Drive	High Invest. LRT	High Invest. LRT w/ Thayer Option
70.83	76.20	78.83	78.41	86.60	76.39	72.76	75.17	75.26	83.45

Table 2-2: Highly Erodible Soils Impacted by the Maintenance and Storage Facility Sites (Acres)

North Veterans Parkway Site	Glenridge Maintenance Facility	MTA New Carrollton Property	Haig Court Site	Lyttonsville Maintenance Facility
21.73	12.10	14.37	0.00	0.09

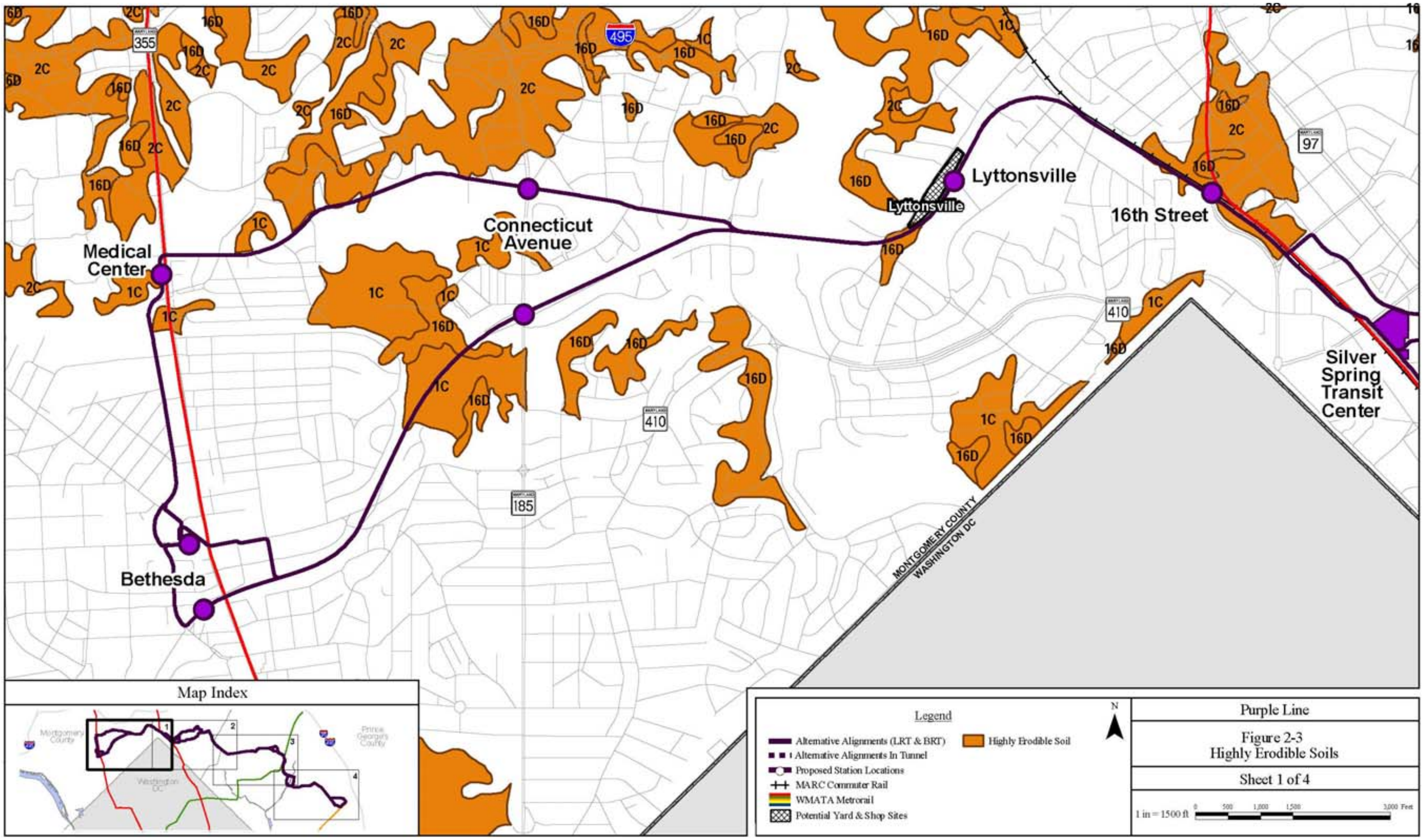

Figure 2-3: Purple Line Highly Erodible Land

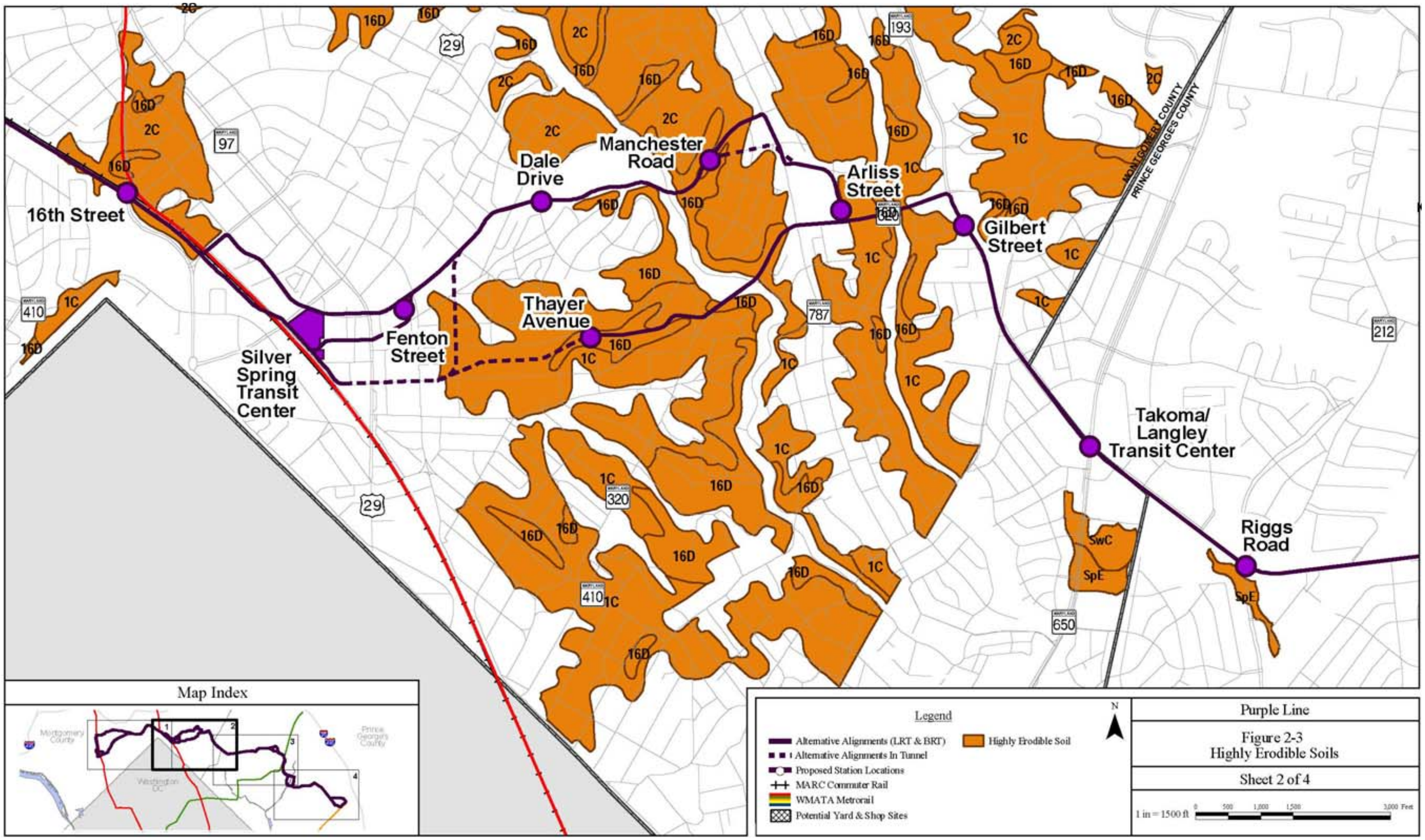

Figure 2-3: Purple Line Highly Erodible Land (continued)

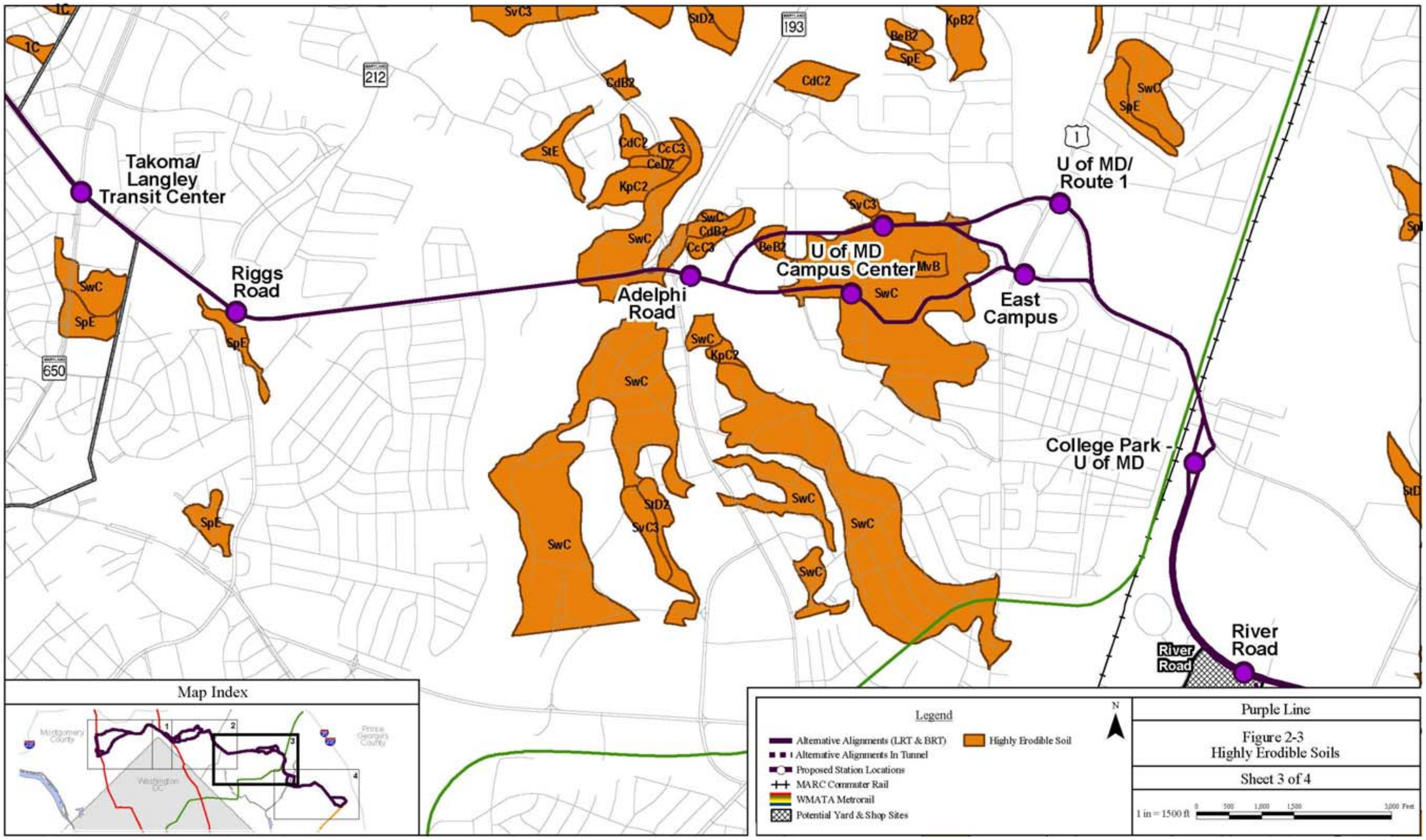

Figure 2-3: Purple Line Highly Erodible Land (continued)

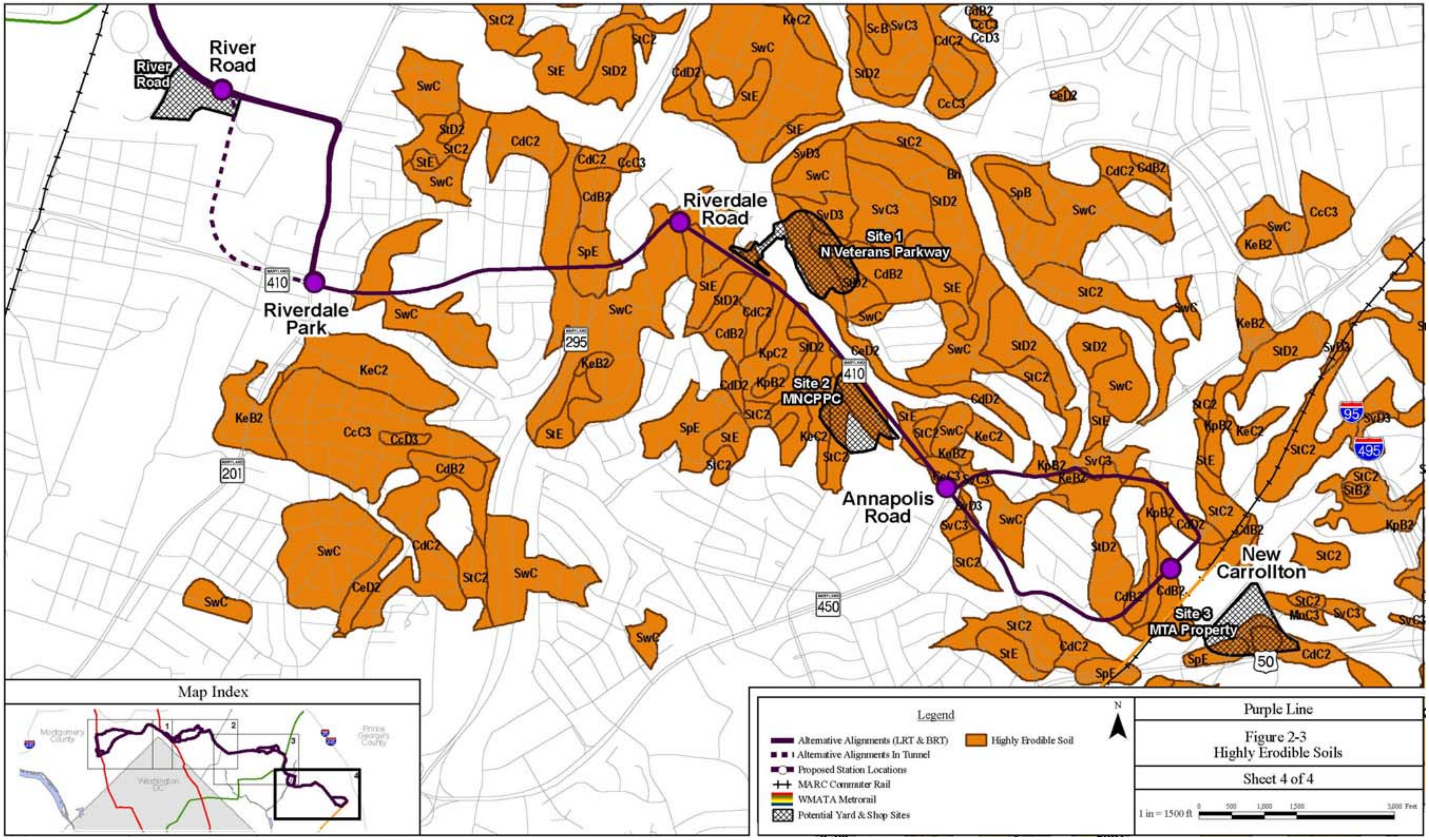

Figure 2-3: Purple Line Highly Erodible Land (continued)

Prime Farmland Soils and Soils of Statewide

Those areas within the corridor designated as potential prime farmland and statewide important soils are already developed. When developed, these soils are no longer considered prime farmland. Therefore, effects to prime farmland and coordination under the Farmland Protection Policy Act are not anticipated.

2.2. Groundwater and Hydrogeology

2.2.1. Methods

Available data from various USGS, MGS, and United States Environmental Protection Agency (EPA) published sources were used to determine the availability and quality of groundwater within the Purple Line corridor. EPA does not have specific water quality criteria that apply only to groundwater. Instead, the agency enforces drinking water standards for water supply systems that use groundwater resources.

2.2.2. Existing Conditions

The hydrogeology of the corridor is largely defined by the geology of the area. Based on the information gathered from the USGS, MGS, and MDE, five main aquifers are located within the corridor. Three major aquifers occur west of Riggs Road within the Piedmont Physiographic Province: crystalline-rock and undifferentiated sedimentary-rock aquifers, aquifers in early Mesozoic basins, and carbonate-rock aquifers. Two aquifers, Castle-Hayne Aquia and Potomac, located within the Coastal Plain Physiographic Province, extend from Riggs Road to the eastern end of the project corridor.

Most of the Piedmont Physiographic Province is underlain by dense impermeable bedrock that yields water from secondary porosity and permeability provided by fractures. Recharge is highly variable in these aquifers because it is determined by local precipitation and runoff, which are highly variable and are influenced by topographic relief, roadway infrastructure, land use, and the infiltration rates of the available land surface (USGS 1997). The crystalline-rock and undifferentiated sedimentary-rock aquifers are primarily composed of crystalline metamorphic and igneous rocks. An unconsolidated, permeable material called regolith overlies these aquifers. The regolith consists of saprolite, colluvium, alluvium, and soil. The hydraulic properties of the regolith vary greatly due to the variation in thickness, composition, and grain size. The recharge and discharge process takes place in these aquifers in instream areas where precipitation enters the regolith and then moves laterally through this material, discharging into nearby streams. However, some of the water moves downward through the regolith until it reaches the bedrock where it enters fractures in crystalline rocks. Base flow ranges from 33 to 67 percent of stream flow in the drainage basins underlain by crystalline rocks (USGS 1997).

The aquifers in the early Mesozoic basins are composed of rocks that lie on crystalline rocks and locally sedimentary rocks. Sedimentary rocks in the basins consist predominately of interbedded shale, sandstone, and siltstone. Groundwater in the early Mesozoic aquifers moves primarily

along joints and fractures. The hydraulic connection between individual aquifers is poor because most groundwater movement is parallel along bedding planes (USGS 1997).

The carbonate-rock aquifers are composed of limestone, dolomite, and marble, which have low permeability and porosity. Water moves through these rocks along joins, faults, and other openings created by dissolution. These mini-aquifers store water in deep fractures or solution channels that can transmit water several miles from recharge areas to discharge areas. Well yields from carbonate-rock aquifers are generally larger than those from the other two aquifers within the corridor. Wells located in rock that is fractured only near the surface will yield from 10 to 20 gallons per minute for a limited amount of time until the fractures are drained. Wells located in depressional areas and valleys tend to have higher-than-average yields as these areas commonly occur near fracture zones in rock or the water table is near or at the surface in topographically low areas. The baseflow of a stream is supported by groundwater discharge and indicates the maximum sustained groundwater yield (USGS 1997).

The Castle Hayne-Aquia aquifer of the Coastal Plain Physiographic Province is subdivided into two local aquifers: the Piney Point Nanjemoy aquifer and the Aquia-Rancocas aquifer. Both aquifers are composed of glauconitic sand from different formations within this group. The aquifers are separated by silt and clay confining units that can be as thick as 210 feet. The water in these aquifers moves laterally from the northwestern limits of the aquifers toward the Potomac River. The Castle Hayne-Aquia aquifer does not receive recharge directly from precipitation and does not discharge by evapotranspiration. Recharge occurs from overlying and underlying aquifers by vertical leakage through confining units.

The Potomac aquifer has an extent that underlies a majority of the eastern portion of the corridor. This larger aquifer includes two local aquifers: Patapsco and Patuxent aquifers. The local Patapsco aquifer and the underlying Patuxent aquifer contain a range of fine to coarse gravelly sand. The clay confining unit that separates the two aquifers is approximately 300 feet thick. The Potomac aquifer receives little direct recharge by precipitation. Water moves laterally through the Potomac aquifer but also flows vertically in and out of the aquifer from overlying aquifers.

Groundwater Quality

Groundwater well withdrawals from the Piedmont Province aquifers are generally suitable for drinking and other uses, but iron, manganese, and sulfate occur locally in concentrations well above EPA's National Secondary Drinking Water Regulations. These regulations are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. EPA recommends secondary standards to water systems but does not require systems to comply. High iron concentrations within drinking water can be attributed to corrosion of steel casings and well fittings, and iron-fixing bacteria. The natural weathering of rocks within the Mesozoic aquifers can also contribute iron and manganese to groundwater, especially if the water is slightly acidic. Water samples from wells drilled in the Piedmont aquifers between October

2005 and September 2006 were well within National Secondary Drinking Water Regulations for iron, manganese, and pH. One well yielded a more acidic pH of 5.5 than the recommended 6.5-8.5 EPA standard (USGS 2006).

The Potomac aquifer of the Coastal Plain province has experienced saline water encroachment in several areas due to the ion-exchange reactions that occur in the water that percolates downward through overlying aquifers and confining units. Groundwater from monitoring wells drilled within the Coastal Plain aquifers had a more acidic pH than the recommended EPA standard (USGS 2006). Samples were significantly elevated above the EPA standards for the following organic compounds: alachor, benzoanthracene, benzopyrene, diethlpthalate, hexachorobenzene, hexachlorocyclopentadiene, and pentachlorophenol. The potential sources of contamination include discharge from rubber and chemical factories, metal refineries, agricultural chemical factories, and wood-preserving factories. Additional sources of contamination include leaching from the linings of water storage tanks and distribution lines and runoff from herbicide used on row crops. The potential health effects from ingesting water with elevated levels of the above-listed contaminants include problems with the eye, liver, kidney, or spleen; anemia; increased risk of cancer; and reproductive difficulties.

2.2.3. Effects

The Low and Medium BRT and LRT Alternatives and the proposed maintenance and storage facility sites are not anticipated to affect corridor groundwater to a substantial degree. These alternatives and the maintenance and storage facilities would be constructed completely on the surface and only minor changes to the movements of the shallow groundwater table are likely to occur during grading and construction of the project facilities. Any runoff would be treated in accordance with MDE guidelines for stormwater management and released to surface waters. Effects to groundwater could potentially occur within High Investment BRT and the LRT Alternatives due to the tunnel components. These alternatives would require tunneling that could intercept groundwater resources in the shallow crystalline aquifers of the Piedmont and shallow groundwater table of the Coastal Plain. Tunnel boring in the Piedmont would likely intercept the rock fractures that are typical of this physiographic province, potentially causing a minor change in localized groundwater paths. These minor changes, however, would not be expected to affect overall groundwater flows or quantities. The tunneling option within the Riverdale Park segment could have an affect on shallow groundwater aquifers associated with the Coastal Plain Province and influence the local groundwater paths associated with Northeast Branch.

Construction of the tunnels would likely require temporary drawdown of the local groundwater table, as water would need to be pumped out to allow for tunnel construction activities. During the geotechnical investigations that would occur in later phases of the project, a groundwater testing program would be undertaken to identify any potential groundwater or soil contaminants that could be encountered during tunnel construction. If contaminants are identified, tunnel designs and construction methods would incorporate environmental safeguards to both protect workers and provide for remediation of contaminants before any discharge of groundwater to surface waters.

2.3. Surface Water Resources/Water Quality

2.3.1. Surface Water Resources

The project corridor contains three Maryland Department of Natural Resources (DNR) third order watersheds: Potomac River Montgomery County, Rock Creek, and the Anacostia River. Within these larger watersheds are six primary corridor subwatersheds: Little Falls, Rock Creek, Sligo Creek, Northwest Branch, Northeast Branch, and Lower Beaverdam Creek, as illustrated in **Figure 2-4**.

Little Falls

The Little Falls subwatershed is located in the westernmost portion of the corridor and drains approximately 10 square miles (6,400 acres). Fifty percent of the subwatershed is developed, 10 percent is used for agriculture, and 30 percent is forested (CBP 2007). The Little Falls stream system originates south of Bethesda and flows south into the Potomac River, near the Montgomery County line. The Little Falls subwatershed is located within the Piedmont Physiographic Province.

The Little Falls subwatershed is one of Montgomery County's most urban stream systems and was greatly influenced by chemical pollution from the 1950s into the 1970s. The causes of this pollution include chlorine discharges from drinking water treatment, sewer line problems, and a large oil spill that occurred in 1959. In 1976, a study found no aquatic life in Little Falls, although more recent studies have shown the presence of pollution-tolerant fish and macroinvertebrate species (Montgomery County Department of Environmental Protection (MCDEP) 2007). The Little Falls subwatershed was placed on MDE's 1996 and 2006 303(d) lists of impaired waters for poor biological conditions and nutrient and sediment impairments.

Rock Creek

The Rock Creek subwatershed, another tributary of the Potomac River, drains approximately 82 square miles (52,480 acres) and lies within the Piedmont Physiographic Province in Montgomery County. Within this subwatershed, 45 percent of land is developed, 19.5 percent is used for agriculture, and 31.7 percent is forested (CBP 2007). The stream originates south of Laytonsville and west of the Oaks Sanitary Landfill in northeast Montgomery County.

The Rock Creek subwatershed contains one of the area's most treasured and frequently used recreation corridors (MCDEP 2007). The forested stream valley corridors provide a protective buffer to the stream and contain wetlands and vernal pools in the floodplain (MCDEP 2007). A major tributary to the Rock Creek watershed within the corridor is Coquelin Run. Coquelin Run originates south of Bethesda, flows east paralleling the south side of the Georgetown Branch Trail, and joins Rock Creek in the Rays Meadow section of Rock Creek Park. The Rock Creek subwatershed was placed on MDE's 1996 and 2002 303(d) lists for poor biological conditions, nutrient impairments, and sediment impairments.

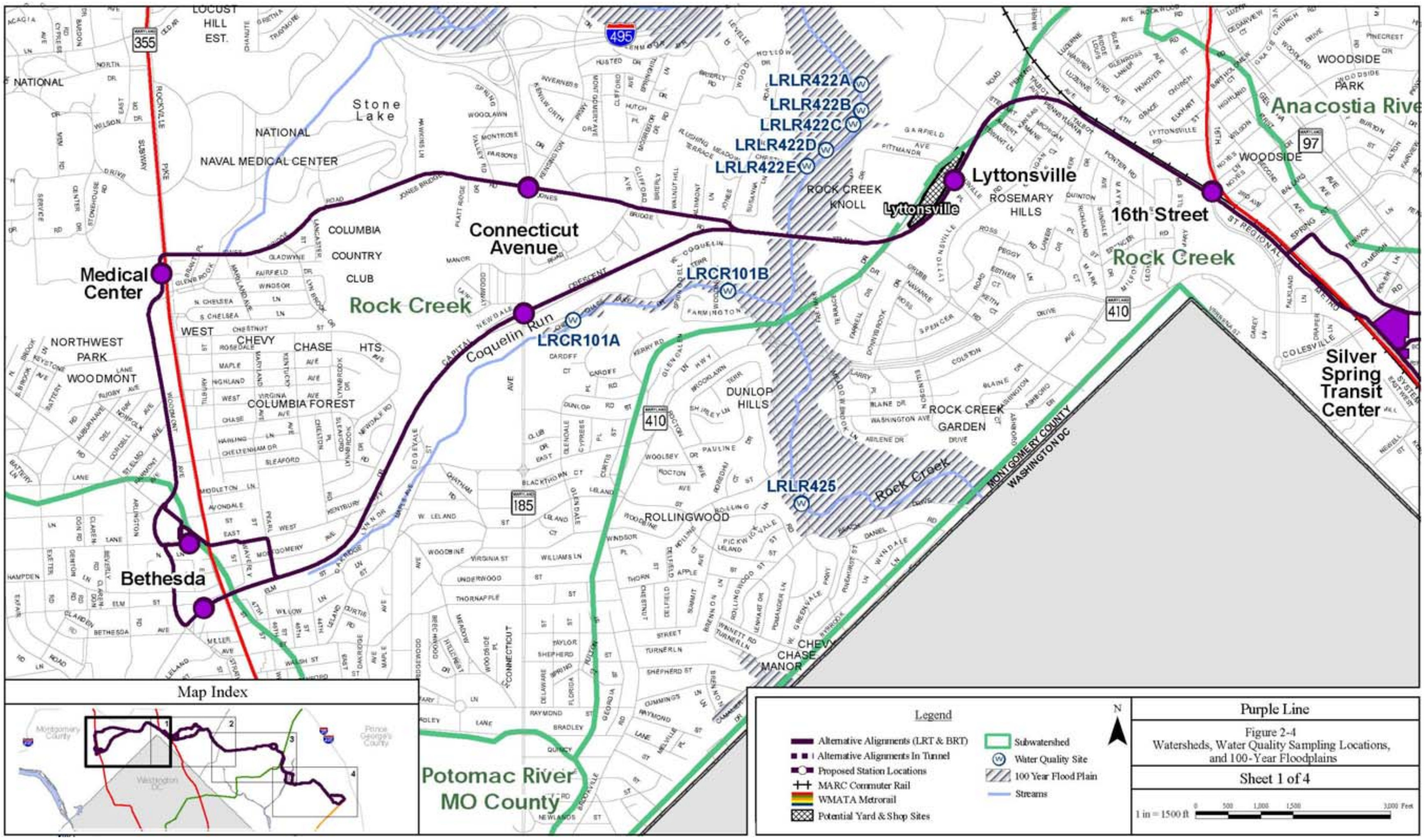

Figure 2-4: Purple Line Water Features

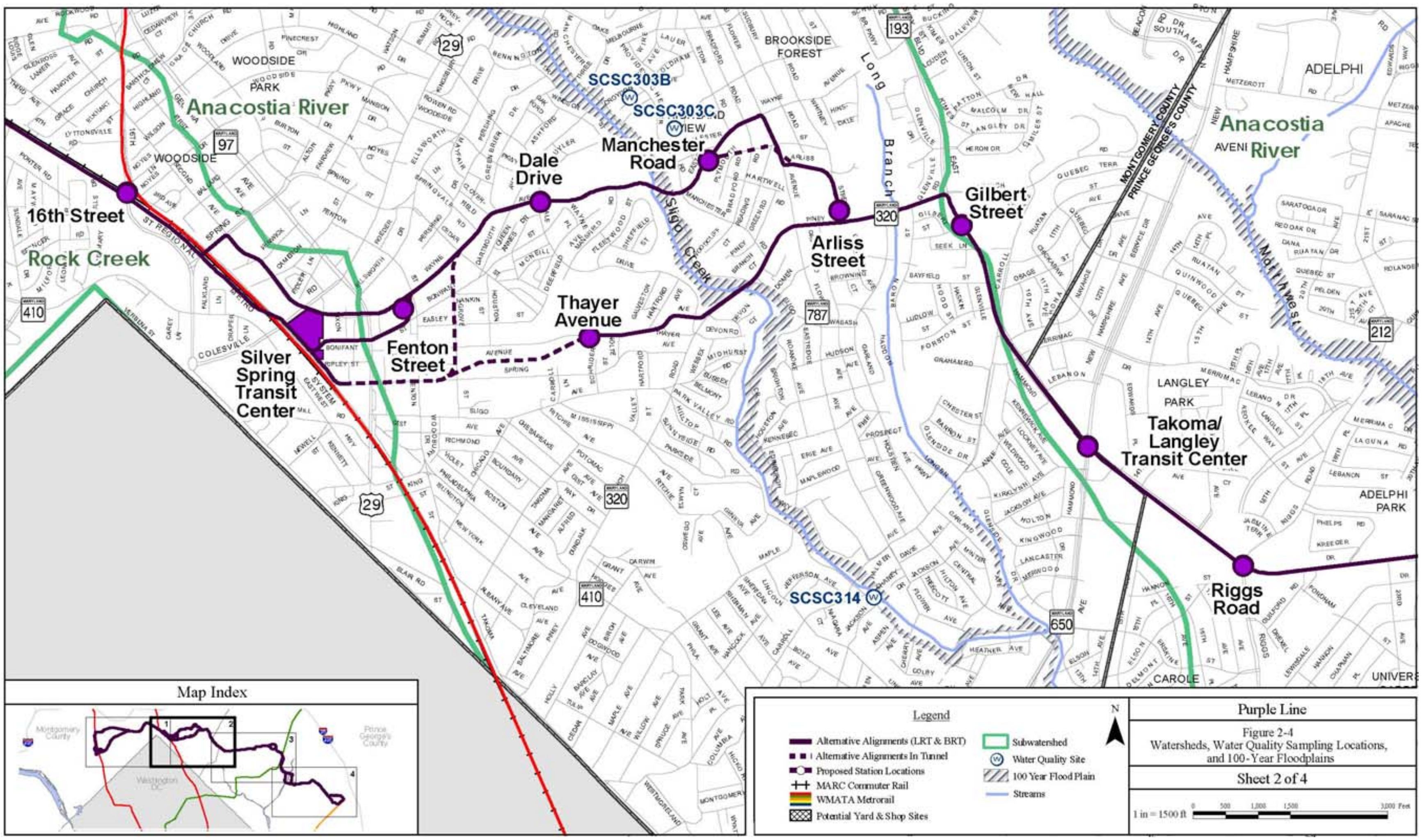

Figure 2-4: Purple Line Water Features (continued)

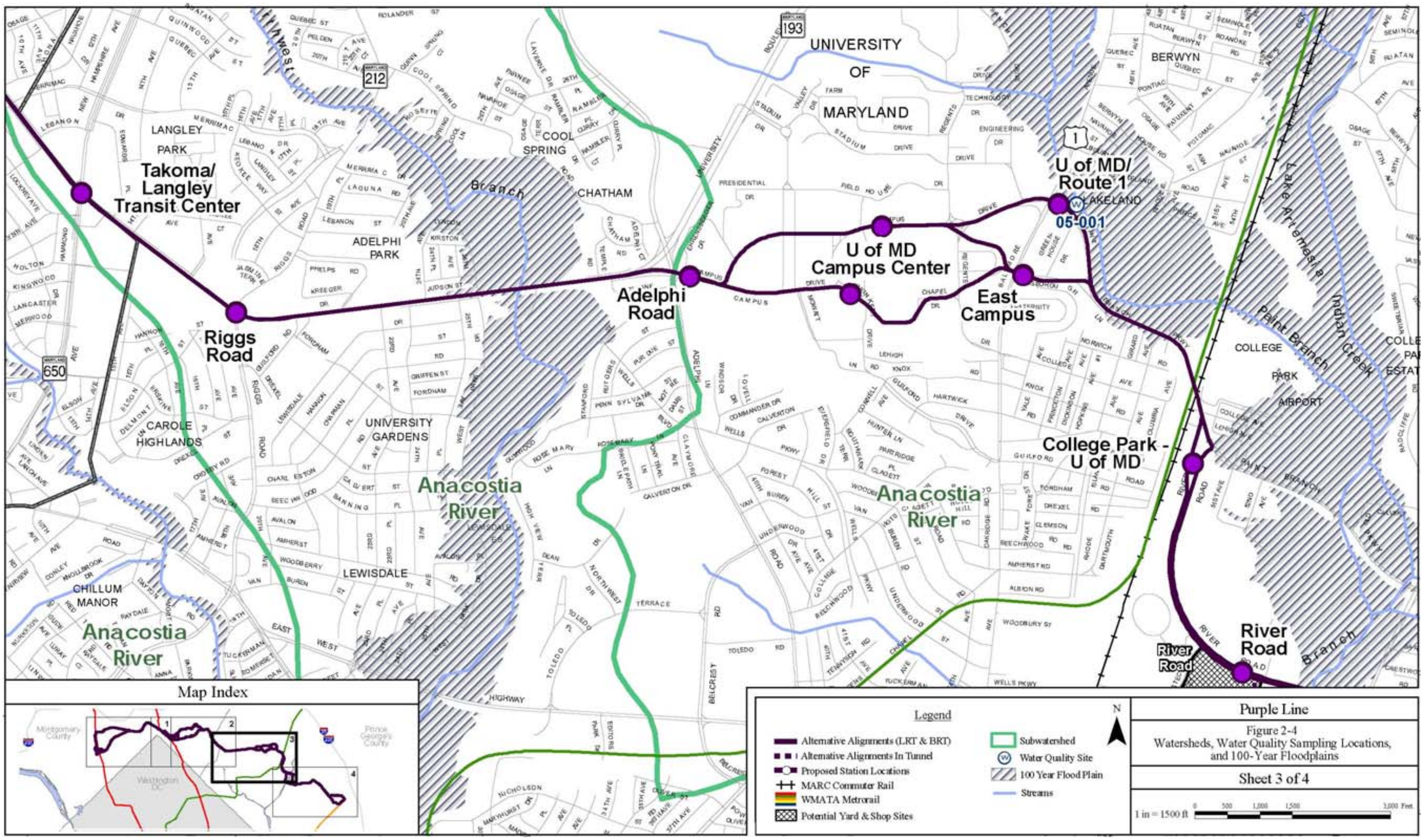

Figure 2-4: Purple Line Water Features (continued)

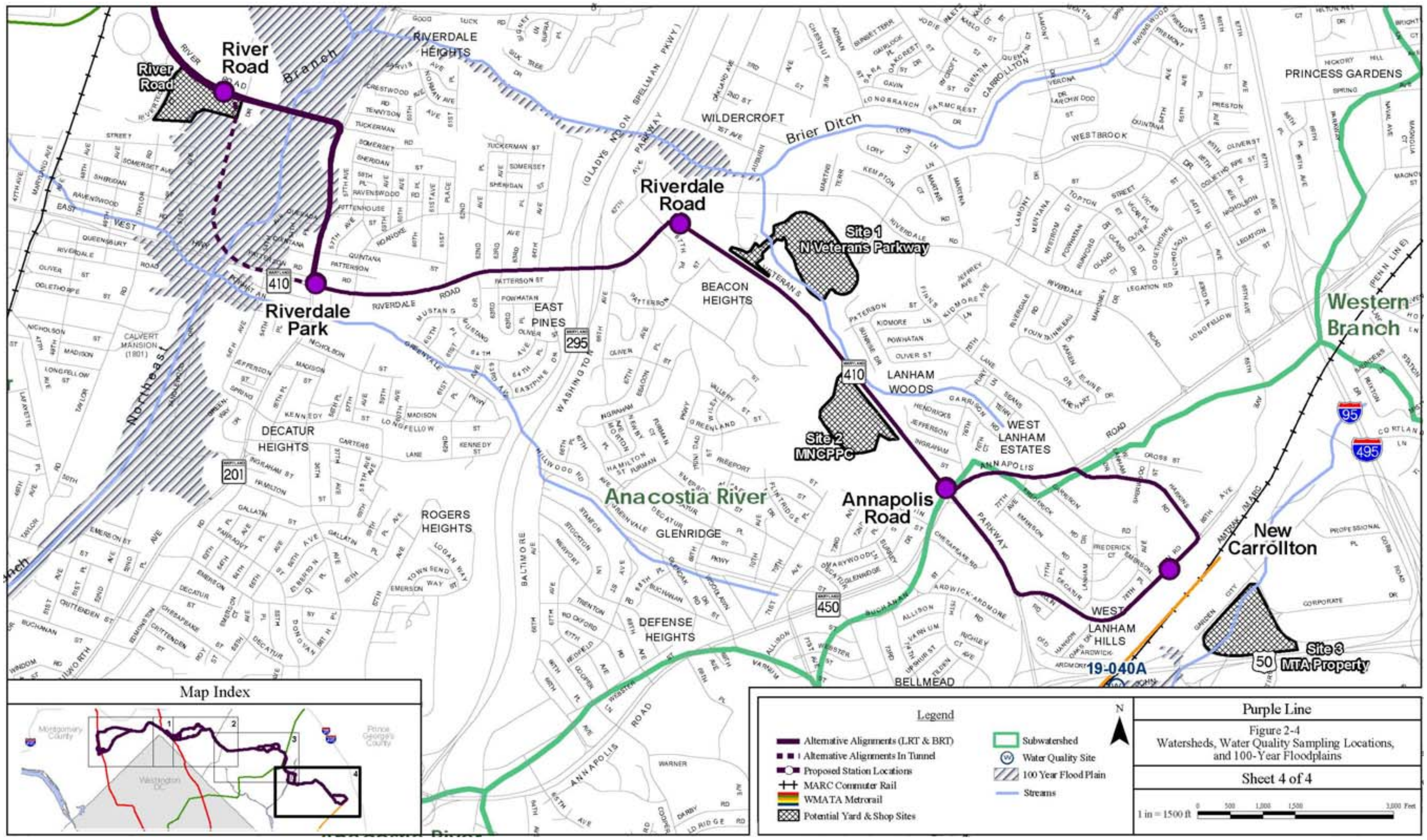

Figure 2-4: Purple Line Water Features (continued)

Sligo Creek

The Sligo Creek subwatershed drains approximately 11.6 square miles (7,424 acres) into the Northwest Branch of the Anacostia River, near Hyattsville. Within this urbanized subwatershed, less than 15 percent is undeveloped and only 10 percent is forested (CBP 2007). The stream system originates in the Kemp Mill section of Silver Spring. This subwatershed occurs in both the Piedmont and the Coastal Plain Physiographic Provinces.

Long Branch is a major tributary of the Sligo Creek subwatershed within the corridor. Long Branch originates southwest of the intersection of I-495 and University Boulevard and flows south through the corridor to join Sligo Creek. Many tributaries of the Sligo Creek subwatershed have been paved over and piped into storm drains. The remaining areas have been channelized, and many banks have been lined with rip-rap to prevent erosion during storm events. These alterations result in little habitat for aquatic life. Until recently, only three pollution-tolerant species of fish were identified in Sligo Creek. New runoff controls and stream channel restoration efforts have allowed for the successful recolonization of native fish species in recent years (MCDEP 2007). The Sligo Creek subwatershed was placed on MDE’s 1996, 2002, and 2006 303(d) lists for biological oxygen demand, sediment impairments, nutrient impairments, polychlorinated biphenyls (PCBs), heptachlor epoxides, and trash and debris.

Northwest Branch

The Northwest Branch is one of the largest subwatersheds in the corridor and drains 41.89 square miles (26,812 acres). Within this subwatershed, more than 50 percent of land use is residential and less than 25 percent is forested (AWN 1999). The Northwest Branch stream system originates southeast of Olney, in Montgomery County. It flows southeast across the Prince George’s County line to meet the Northeast Branch, north of Bladensburg, forming the Anacostia River. This subwatershed occurs in both the Piedmont and the Coastal Plain Physiographic Provinces.

The headwaters of the Northwest Branch include some of the best water quality conditions in the Anacostia watershed. However, in the lower portions of the Northwest Branch these conditions deteriorate due to higher density development, stream channelization, and stormwater impacts (AWN 1999). The Northwest Branch subwatershed was placed on MDE’s 1996, 2002, and 2006 303(d) lists for biological oxygen demand, sediment impairments, nutrient impairments, PCBs, heptachlor epoxides, and trash and debris. Seven data points in the Northwest Branch subwatershed support the 303(d) listing of the non-tidal portion of the Anacostia River for biological impairment.

Northeast Branch

The Northeast Branch subwatershed drains approximately 14.7 square miles (9,419 acres). Fifty-one percent of the subwatershed is residential, 26 percent is forested, and 10 percent is commercial (Anacostia Watershed Network 1999). The stream originates east of College Park at the confluence of Paint Branch and Indian Creek. Northeast Branch flows south from the

confluence to meet the Northwest Branch, north of Bladensburg, to form the Anacostia River. This subwatershed occurs entirely within the Coastal Plain Physiographic Province.

The Northeast Branch subwatershed is channelized for 85 percent of its mainstem length, and most of it is managed as a flood-control channel. This prevents the growth of a riparian forest buffer and, consequently, only 21 percent of the mainstem has an adequate riparian buffer. Thermal loading resulting from channelization and lack of in-stream shading may impair aquatic biotic communities (AWN 1999). The Northeast Branch subwatershed was placed on MDE's 1996, 2002, and 2006 303(d) lists for biological oxygen demand, sediment impairments, nutrient impairments, PCBs, heptachlor epoxides, and trash and debris.

Lower Beaverdam Creek

The Lower Beaverdam Creek subwatershed drains 15.7 square miles (10,065 acres). Within this subwatershed, 44 percent of land is in residential land use, 22 percent is forested, and 17 percent is industrial (AWN 1999). The stream flows west, paralleling the south side of US 50 and joins the Anacostia River in the District of Columbia. The subwatershed is located entirely in the Coastal Plain Physiographic Province.

The Lower Beaverdam Creek subwatershed is one of the most developed sections of the Anacostia watershed with its headwaters in dense residential and commercial development. Only 20 percent of the mainstem has an adequate riparian forest buffer. The degradation of aquatic habitat and poor water quality in Lower Beaverdam Creek has severely impaired the aquatic community (AWN 1999). The Lower Beaverdam Creek subwatershed was placed on MDE's 1996, 2002, and 2006 303(d) lists for biological oxygen demand, sediment impairments, nutrient impairments, PCBs, heptachlor epoxides, and trash and debris.

2.3.2. Chemical Water Quality

Methods

The MDE has established acceptable standards for several water quality parameters for each designated Stream Use Classification. The standards are listed in the *Code of Maryland Regulations* (COMAR) 26.08.02.01-.03 – *Water Quality* and are shown in **Table 2-3**. With the exception of a portion of Northwest Branch, all streams within the corridor are classified as Use I-P, which is designated for water contact recreation, protection of aquatic life, and public water supply. Northwest Branch north of East West Highway is designated as Use IV recreational trout waters.

Each parameter, measured by in situ sampling and regulated by the State of Maryland, can have a substantial effect on the aquatic communities of streams. These parameters – temperature, pH, dissolved oxygen, turbidity, and conductivity – each have different effects on aquatic biota.

Existing data on the characteristics of the chemical water quality of the project-area watersheds were gathered from the MCDEP, the DNR Maryland Biological Stream Survey (MBSS), and the

Prince George's County Department of Environmental Resources (PGDER). These data have been collected at varying intervals, and only data collected since 2000 were considered current.

Table 2-3: Use 1-P and Use IV COMAR Standards

Parameter	Use I-P	Use IV
Temperature	Maximum of 90°F (32°C) or ambient temperature, whichever is greater	Maximum of 75°F (23.9°C) or ambient temperature, whichever is greater
pH	6.5 to 8.5	6.5 to 8.5
Dissolved Oxygen	Minimum of 5 mg/L	Minimum of 5 mg/L
Turbidity	Maximum of 150 Nephelometer Turbidity Units (NTU) and maximum monthly average of 50 NTU	Maximum of 150 Nephelometer Turbidity Units (NTU) and maximum monthly average of 50 NTU

Source: Maryland COMAR

Results

The results of the chemical water quality sampling are summarized in the following tables. The chemical water quality sampling locations are shown in **Table 2-4 and Table 2-5**.

Generally, the six subwatersheds in the corridor have in-situ water quality averages that were within state water quality standards. Only one out of 34 sites within the Rock Creek subwatershed was below state standards for dissolved oxygen. Within the Little Falls subwatershed, dissolved oxygen levels were below Maryland state standards at 12.5 percent of the sites at the time of sampling. Twenty percent of the sites in the Sligo Creek subwatershed exhibited dissolved oxygen levels below state standards. The pH levels were elevated above state standards at 25 percent of the sites in the Northwest Branch subwatershed. Within the Northeast Branch subwatershed, pH levels were below state standards at 25 percent of the readings. No sites within the Lower Beaverdam Creek subwatershed were outside of state standards. The highest conductivity levels were seen in Lower Beaverdam Creek and Little Falls, which would be expected due to the high urbanization of these two watersheds.

Table 2-4: Summary of Chemical Water Quality Conditions in the Little Falls, Rock Creek, and Sligo Creek Watersheds

Parameter	Standard	Little Falls		Rock Creek		Sligo Creek	
		Avg	% outside standard	Avg	% outside standard	Avg	% outside standard
Dissolved Oxygen (mg/L)	>5	8.26	12.5	11.21	2.9	8.32	20
pH (field)	6.5 to 8.5	7.47	0	7.31	0	7.40	0
Temperature (°C)	<32°C	16.70	0	15.41	0	18.9	0
Conductivity (µS/cm)	none	0.605	N/A	0.333	N/A	0.372	N/A

Source: MBSS On-line Resource, MCDEP, and PGDER; N/A= sample not collected

Table 2-5: Summary of Chemical Water Quality Conditions in the Northwest Branch, Northeast Branch, and Lower Beaverdam Creek Watersheds

Parameter	Standard	Northwest Branch		Northeast Branch		Lower Beaverdam Creek	
		Avg	% outside standard	Avg	% outside standard	Avg	% outside standard
Dissolved Oxygen (mg/L)	>5	8.61	0	10.80	0	9.89	0
pH (field)	6.5 to 8.5	7.63	25	6.93	25	7.53	0
Temperature (°C)	<32°C	19.34	0	12.52	0	9.50	0
Conductivity (µS/cm)	none	0.241	N/A	0.262	N/A	0.520	N/A

Source: MBSS On-line Resource, MCDEP, and PGDER; NA= sample not collected

Effects

All of the Build Alternatives and maintenance and storage facility sites have the potential to increase levels of certain contaminants within the affected subwatersheds. These increases would be expected to be greatly minimized with the use of approved sediment and erosion control measures during construction and implementation of stormwater best management practices, as required by MDE. However, some degree of chemical water quality impairment could still occur, especially within the proposed maintenance and storage facilities, exacerbating problems within subwatersheds where contaminant levels are already elevated.

Potential impacts during construction include physical disturbances or alterations, accidental spills, and sediment releases that can affect aquatic life. During construction, large areas of exposed soil can be severely eroded by wind and rain when the vegetation and naturally occurring soil stabilizers are removed. Erosion of these exposed soils can considerably increase the sediment load to receiving waters (Barrett 1995).

Impacts associated with the use of the Build Alternatives and maintenance and storage sites after construction, are mainly based on the potential for contamination of surface waters by run-off from new impervious surfaces. These runoff constituents can be grouped as heavy metals, salt, organic molecules, and nutrients (Trombulak 1999). **Table 2-6** contains a list of common roadway runoff constituents and their sources, which would primarily be associated with the BRT Alternatives where additional pavement could be added for lane widening to accommodate the transitway and paved portions of the LRT. Runoff could also occur at station areas, maintenance and storage facilities and to a lesser degree in the ballasted portions of the LRT. The ballasted sections of the LRT would occur mainly within the Bethesda/Chevy Chase and Silver Spring segments and ballast is also being considered along River Road and Veterans Parkway.

Table 2-6: Common Roadway Runoff Constituents and Their Primary Sources

Constituent	Primary Sources
Particulates	Pavement wear, vehicles, atmosphere, maintenance
Nitrogen, Phosphorous	Atmosphere, roadside fertilizer application
Lead	Leaded gasoline (auto exhaust), tire wear (lead oxide filler material), lubricating oil and grease, bearing wear
Zinc	Tire wear (filler material), motor oil (stabilizing additive), grease
Iron	Auto body rust, steel highway structures (guardrails, etc.), moving engine parts
Copper	Metal plating, bearing and bushing wear, moving engine parts, brake lining wear, fungicides and insecticides applied by maintenance operations
Cadmium	Tire wear (filler material), insecticide application
Chromium	Metal plating, moving engine parts, brake lining wear
Nickel	Diesel fuel and gasoline (exhaust), lubricating oil, metal plating, bushing wear, brake lining wear, asphalt paving
Manganese	Moving engine parts
Bromide	Exhaust
Cyanide	Anticake compound (ferric ferrocyanide, Prussian Blue or sodium ferrocyanide, Yellow Prussiate of Soda) used to keep deicing salt granular
Sodium, Calcium	Deicing salts, grease
Chloride	Deicing salts
Sulfate	Roadway blends, fuel, deicing salts
Petroleum	Spills, leaks or blow-by of motor lubricants, antifreeze and hydraulic fluids, asphalt surface leachate
PCBs	Spraying of highway right-of-ways, background atmospheric deposition, PCB catalyst in synthetic tires
Pesticides, Pathogenic Bacteria (indicators)	Soil, litter, bird droppings, and trucks hauling livestock and stockyard waste
Rubber	Tire wear
Asbestos	Clutch and brake lining wear

Source: Kobriger 1984

Heavy metal concentration in nearby surface waters can be increased from increased impervious surfaces and vehicle use. The most common heavy metal contaminants are lead, aluminum, iron, cadmium, copper, manganese, titanium, nickel, zinc, and boron. Most of these contaminants are related to gasoline additives and regular roadway maintenance. Other sources of metals include mobilization by excavation, vehicle wear, combustion of petroleum products, historical fuel additives, and catalytic-converter emissions. Generally, heavy metals from roadways found in streams are not at concentrations high enough to cause acute toxicity (CWP 2003). The greatest concern associated with metals, even at low concentrations, is the long-term accumulation in bottom sediments and animal tissues.

Another group of pollutants, organic molecules including dioxins and PCBs, have been found to be in higher concentrations along roadways. Sources of these compounds include run-off

derived from exhaust, fuel, lubricants, and asphalt (Buckler 1999). Other pollutants in this group include polycyclic aromatic hydrocarbon, benzene, toluene, ethylbenzene, xylene (BTEX), and methyl tertiary butyl ether (MTBE) (Buckler 1999). Vehicle emissions have been shown to be an important source of the BTEX compounds. These organic pollutants are known to accumulate in concentrations that will cause mortality and affect growth and reproduction in aquatic organisms (Lopes et al. 1998).

While all of the Build Alternatives and maintenance and storage facilities have the potential to increase existing surface water impairment to some degree, the relatively small amount of new impervious surfaces and related pollutants that the project would add to the highly urbanized setting of the corridor would be expected to cause only minimal changes, if any, in corridor water quality.

During construction, the potential for water quality impacts would be minimized through strict adherence to MDE-approved sediment and erosion control plans, which would include best management practices such as super silt fence, straw bales, sediment basins, and other methods to capture potential sediment from exposed soils. SWM management plans will be approved and designed in compliance with MDE to treat both quantity and quality of stormwater runoff prior to discharge into receiving waters. For Class I surface waters, in-stream work may not be conducted during the period March 1 through June 15, inclusive, during any year, while Class IV have an in-stream restriction during the period March 1 through May 31.

Total Maximum Daily Loads

Methods

A total maximum daily load (TMDL) is an estimate of the maximum amount of a pollutant that a waterbody can absorb without violating ambient water quality standards (MDE 2007). This load includes both point source and nonpoint source pollutants. A TMDL is developed as part of the state requirements under Section 303 of the Clean Water Act (CWA). Each state is required to prepare a biannual list of stream segments that are considered “impaired” and submit this list (303(d) list) to EPA. These segments are known as water quality limited (WQL) segments, and a TMDL must be developed for each. These WQL can be considered “impaired” by analyzing a wide variety of water quality monitoring data, including chemical grab samples, in situ measurements, continuous measurements, and biological data. After listing a stream as a WQL on the 303(d) list, the state is required to prioritize each waterbody’s need for TMDL development. Several WQL segments have been identified by MDE within the corridor, and the status and results of the TMDL process are summarized in **Table 2-7**.

Table 2-7: Current Status of TMDL within the Project Corridor

Watershed/Basin	Impairment	Status
Anacostia River	Bacteria	Approved: March 14, 2007
Anacostia River (tidal)	PCBs	Approved: October 31, 2007
Anacostia River (non-tidal)	PCBs	Under Development 2009
Anacostia River	Sediment	Approved: July 24, 2007
Anacostia River	Nutrients	Public Comment Period Ends: April 7, 2008
Rock Creek	Bacteria	Approved: July 30, 2007

Source: MDE TMDL On-line Resource (www.mde.state.md.us/Programs/WaterPrograms/TMDL)

Existing Conditions

The Little Falls subwatershed is part of the non-tidal portion of the Potomac River Montgomery County watershed. This portion of the Potomac River was listed by MDE in 2006 as required to develop a TMDL due to poor biological conditions. It was also listed in 1996 to develop TMDL for nutrient and sediment impairments, with a low priority (MDE 2007). A TMDL for these impairments has not yet been developed.

The non-tidal portion of Rock Creek was listed by MDE in 2002 as being required to develop a TMDL due to poor biological conditions. It was also listed in 1996 to develop TMDLs for nutrient and sediment impairments (MDE 2007). A TMDL for these impairments has not yet been developed as both listings of Rock Creek are of low priority.

The non-tidal portion of the Anacostia River watershed, including Sligo Creek, Northwest Branch, Northeast Branch, and Lower Beaverdam Creek subwatersheds, was listed in 1996 as requiring development of TMDLs for biochemical, sediments, and nutrients. In 2002, it was listed for TMDL development related to PCBs and heptachlor epoxide due to concentrations in the water column that exceed the criteria for human fish consumption. It was also listed in 2006 to develop a TMDL for trash and debris (MDE 2007). All of the listings of the non-tidal portion of the Anacostia River are designated as a low priority for TMDL development.

Effects

Due to the highly developed nature of the project corridor and the existing stormwater infrastructure, increases in nutrient levels from the implementation of a Build Alternative is unlikely to affect TMDL management. The TMDL document for PCBs is still under development; therefore, source allocation of the contaminant is unclear. Several sources of PCBs are associated with roadways; however, these are minimal and are incorporated into the TMDL plan for urban stormwater sources of PCBs. TMDL documents have not yet begun for biological impairment in any of the corridor watersheds. The implementation of a Build Alternative may have impacts to aquatic biota. Due to the size of the potentially impacted watersheds in relation to the magnitude of project related changes, overall increases in biological impairment would be expected to be minimal. These impacts to the biological community are discussed in more detail in **Section 2-7,** Aquatic Biota. A TMDL has not been developed within the Anacostia River for heptachlor epoxide or trash and debris and consequently is not clear what

the primary sources are and whether or not the implementation of a Build Alternative would have a negative effect on these levels. The TMDL document for sediment impairment within the Anacostia River watershed noted upstream sediment loads as a primary source of these contaminants. Implementation of a Build Alternative could potentially have effects on the sediment load in the receiving waters located downstream of the corridor during construction. Strict adherence to required sediment and erosion control protocols would reduce the potential for increased sediment loads within the Anacostia River watershed. A TMDL for sediment impairment within the Rock Creek and Little Falls watershed has not yet been developed; therefore, the sources of sediment within these watersheds are unclear. The TMDL document addressing bacteria levels within Rock Creek points to sources including sanitary sewers, municipal wastewater treatment plants, stormwater, and leaking septic tanks. The implementation of a Build Alternative would unlikely affect these sources.

2.4. Scenic and Wild Rivers

The DNR Scenic and Wild Rivers program (COMAR Section 8-402) was developed to protect the scenic, recreational, and aquatic habitat values of the state's wild and scenic rivers under the National Wild and Scenic River Act (16 U.S.C. §§1271-1287). This Act provides the state with the authority to designate a river as wild and scenic. As defined under this Act, a Scenic and Wild River possesses outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values. The DNR program regulates present and future use and development of the Scenic and Wild River, tributaries, and adjacent land areas to protect their primitive qualities and characteristics and to protect the water quality of the river. This Act does not halt development and use of a river; instead the goal is to preserve the character of the river.

2.4.1. Methods

The coordinator of the DNR Scenic and Wild Rivers program was contacted to determine which corridor streams are designated as scenic and wild by the state.

2.4.2. Existing Conditions

According to the DNR, the Potomac River (only in Montgomery and Frederick Counties) and the Anacostia River and their tributaries are designated as Scenic and Wild Rivers. The tributaries to the Potomac River and Anacostia River that fall under this designation and occur within the corridor are Little Falls, Sligo Creek, Northwest Branch, Northeast Branch, and Lower Beaverdam Creek. Although Rock Creek is a tributary of the Potomac River, it joins the Potomac downstream of the scenic and wild river limits; therefore, Rock Creek is not considered a Scenic and Wild River.

2.4.3. Effects

All of the Build Alternatives are anticipated to have minimal impacts to streams designated as Scenic and Wild because impacts are primarily associated with extensions of existing bridges and culverts to accommodate the transit service rather than new stream crossings. The MTA

property maintenance facility site has the potential to impact Beaverdam Creek due to its location within the headwaters of this system. This stream already experiences a high percentage of impervious runoff and buffer loss as it is surrounded by the New Carrollton MARC facility and associated park-and-ride lots. The proposed maintenance and storage facility is the only area within this portion of the stream that has not been developed.

DNR reviews potential impacts to waterways designated as a Scenic and Wild River. Before specific plans for use and development of water and related land resources associated with a Scenic and Wild River are approved, including constructing improvements, diversions, roadways, crossings, or other uses that change the character of a river or waterway or destroy its scenic value, DNR gives full consideration of and provides evaluation of the river as a scenic and wild resource. The assessment of Little Falls, Sligo Creek, Northwest Branch, Northeast Branch, and Lower Beaverdam Creek to determine the impacts associated with these Scenic and Wild Rivers would be undertaken as part of DNR's environmental review process for the project.

2.5. Floodplains

2.5.1. Methods

United States Department of Transportation Order 5650.2, *Floodplain Management and Protection*, prescribes policies and procedures for ensuring that proper consideration is given to the avoidance and mitigation of adverse floodplain effects. Data from the Federal Emergency Management Agency was used to determine the approximate locations of 100-year floodplains in the corridor, as shown in **Figure 2-4**. The following streams within the corridor have associated 100-year floodplains: Coquelin Run, Rock Creek, Sligo Creek, Northwest Branch, Paint Branch, Northeast Branch, Brier Ditch, and Beaverdam Creek. The majority of these floodplains are wooded as they have been designated as stream valley parks, preventing the current or future development of these parcels. However, substantial floodplain encroachment has occurred from private development and city and county infrastructure, with numerous streets, sewer lines, and water mains crossing or paralleling designated floodplain areas. This is especially true within the floodplains of Coquelin Run, Northeast Branch, and Beaverdam Creek. Despite these encroachments, the 100-year floodplains along the corridor streams continue to provide important floodplain values including, but not limited to, moderation of floodflows, water quality benefits, and habitat for wildlife.

2.5.2. Existing Conditions

Bethesda/Chevy Chase Segment

The 100-year floodplain of Rock Creek is located within the Bethesda/Chevy Chase segment of the corridor. The forested floodplain of Rock Creek is very wide and extends north to south, perpendicularly through the corridor.

Silver Spring Segment

The 100-year floodplain for Sligo Creek extends in a north/south direction through the Silver Spring segment. This area is primarily forested due to its designation as Sligo Creek Park. The floodplain is confined at Wayne Avenue and Piney Branch Road.

University Boulevard Segment

The Northwest Branch 100-year floodplain extends perpendicularly across Piney Branch Road. The 100-year floodplain is roughly contained within the Northwest Branch Stream Valley Park boundaries and is comprised of a narrow, forested, riparian buffer and maintained lawn for park services.

UM/College Park Segment

The extensive 100-year floodplain of Paint Branch and one of its tributaries parallels Paint Branch Parkway for its entire length within this segment. A majority of this floodplain has been manipulated to accommodate the College Park Airport and other UM facilities. A small portion of the floodplain is designated as the Paint Branch Stream Valley Park.

Riverdale Park Segment

The 100-year floodplain of Paint Branch ends within this segment, and the 100-year floodplain of Northeast Branch continues south past Riverdale Road. This very large floodplain includes Anacostia River Park, which is mostly forested, and Calvert Road Community Park, which primarily contains park facilities.

New Carrollton Segment

No 100-year floodplains were identified within this segment of the corridor.

Maintenance Facility Sites

The 100-year floodplain of Northeast Branch extends into the Haig Court Site. No 100-year floodplains were identified within the other potential sites.

2.5.3. Effects

All of the Build Alternatives have the potential to affect 100-year floodplains within the project corridor as shown in **Table 2-8**. The impacts to 100-year floodplains were calculated using a footprint that assumes the greatest potential extent of disturbance because design elements associated with the Build Alternatives are still being refined. Impacts to 100-year floodplains would most likely be lower than this "worst case" calculation as the design elements are configured into the Build Alternatives. The footprint also includes multiple design options within the Silver Spring area that are not being calculated separately at this point. Once a locally preferred alternative is selected, the impact numbers would most likely be reduced as redundant impacts from multiple design options are removed. Medium Investment LRT would impact the

largest area of 100-year floodplains (15.11 acres), while Medium Investment BRT with the Preinkert Drive Option would impact the least amount of 100-year floodplains (13.46 acres).

Table 2-8: The Aerial Extent of Floodplain Impacts Associated with the BRT and LRT Alternatives (Acres)

Low Invest. BRT	Medium Invest. BRT	Medium Invest. BRT w/ Preinkert Drive	High Invest. BRT	High Invest. BRT w/ Thayer Option	Low Invest. LRT	Medium Invest. LRT	Medium Invest. LRT w/ Preinkert Drive	High Invest. LRT	High Invest. LRT w/ Thayer Option
14.55	13.72	13.46	13.68	13.69	14.19	15.11	14.31	13.80	13.82

The proposed tunnel from River Road to East West Highway under High Investment BRT and LRT would have the greatest impact due to the at-grade and tunnel options that cross the Northeast Branch 100-year floodplain. These impacts could be reduced substantially during later phases of the project when the design is refined, as the footprint in this area assumes an at-grade crossing of the floodplain. The tunnel would most likely be designed as a deep tunnel that would not have a cut and cover option and most likely would not affect the surface of the 100-year floodplain. Therefore, impacts to the 100-year floodplain of Northeast Branch would be expected to decrease. The portals associated with this tunnel would be placed above floodplain elevations on River Road and East West Highway just outside of the 100-year floodplain of Northeast Branch. The second greatest impact under all of the Build Alternatives would occur within the 100-year floodplain of Northwest Branch.

The placement of substantial amounts of fill in floodplain areas is not anticipated for the at-grade components of the Build Alternatives. However, fill may be placed in the 100-year floodplain in areas where the existing road berm may need to be extended to support the placement of aerial structures and the construction of grade separations. The Haig Court Site has the potential to impact 0.67 acres of the 100-year floodplain of Northeast Branch where the floodplain may need to be graded and filled to support the infrastructure of this site, shown in **Table 2-9**. No impacts to 100-year floodplains are anticipated with the remaining maintenance and storage facility sites.

Table 2-9: Floodplain Impacts Associated with the Maintenance and Storage Facility Sites (Acres)

North Veterans Parkway Site	Glenridge Maintenance Facility	MTA New Carrollton Property	Haig Court Site	Lyttonsville Maintenance Facility
0.00	0.00	0.00	0.67	0.00

In later phases of the project, hydraulic and hydrologic studies will be required to determine if any of the floodplain encroachments that would occur would have negative effects on storage areas for floodwaters or alter flooding characteristics. Any construction within the 100-year floodplain will require a Waterway Construction Permit from the MDE. If hydraulic studies determine that floodplain effects would cause an increase in the 100-year flood elevation, the following applies: 1) any increase of less than 0.1 feet is considered negligible and does not require mitigation, 2) a 1-foot maximum increase in the 100-year flood elevation is permissible provided that the permit holder purchase the additional potentially flooded property from any private landowner, or 3) the permit holder may make floodplain modifications to decrease the 100-year flood elevation to within 0.1 feet to avoid purchasing property.

2.6. Waters of the United States, including Wetlands

2.6.1. Methods

Waters of the United States, including wetlands, are regulated under Sections 401 and 404 of the CWA, the Maryland Tidal Wetlands Act, and the State of Maryland Nontidal Wetlands Protection Act.

Information on potential waters of the United States, including wetlands, within the corridor were gathered from published sources, including the United States Fish and Wildlife Service (USFWS) National Wetland Inventory) maps and NRCS Soil Surveys for Prince George's and Montgomery Counties. This information was used to verify and supplement a wetland delineation conducted between June and September 2007. All areas within 100 feet of proposed alternatives, station areas, and maintenance and storage facility sites were investigated. Waters of the United States, including wetlands, were identified and flagged in accordance with the 1987 United States Army Corps of Engineers (Corps) *Wetlands Delineation Manual* (Corps 1987), which employs a three-parameter approach to wetland identification using hydrophytic vegetation, hydric soils, and hydrology. All three parameters must be present for an area to be considered a jurisdictional wetland under Section 404 of the CWA. Areas that do not meet all three of these parameters, but may still be regulated, include palustrine open water (ponds), stream systems (waters of the United States), and certain disturbed areas.

In recent years, ephemeral channels, which carry wet-weather flows, were considered jurisdictional based on their connectivity to regulated wetlands and streams. In mid-2006 the Supreme Court decision in *Rapanos v. U.S.*, 126 S. CT. 2208 (2006) limited the Corps' jurisdiction over ephemeral channels and other wetland features. Based on recent EPA and Corps guidance, the agencies will assert jurisdiction over the following waters of the United States:

- Traditional navigable waterways (TNWs)
- Wetlands adjacent to TNWs

- Non-navigable tributaries of TNWs that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least three months of the year
- Wetlands that abut such tributaries

The agencies will determine jurisdiction on a case-by-case basis over the following waters after a basis analysis has been performed to determine whether they have a significant nexus with a TNW:

- Non-navigable tributaries that are not relatively permanent
- Wetlands adjacent to non-navigable tributaries that are not relatively permanent
- Wetlands adjacent to, but that do not directly abut, a relatively permanent non-navigable tributary

A significant nexus evaluation will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of downstream TNWs. As a matter of policy, not law, the Corps requires performing a significant nexus evaluation on all intermittent non-navigable (not perennial) tributaries and their adjacent wetlands, even if the tributary's flow may be relatively permanent. All jurisdictional determinations (JDs) with a significant nexus evaluation will be reviewed by EPA before a JD will be issued for the project. The Baltimore District of the Corps is still in the process of implementing this guidance for JDs and the issuance of permits.

In 2003, a JD was received from the Corps for the portion of the project previously studied as the Purple Line West (along the old Georgetown Branch study corridor) between Bethesda and Silver Spring (see Appendix B). Because JDs are typically valid for five years, new delineations were not conducted in this portion of the corridor. A JD for the entire project will not be conducted until later phases of the project, when a preferred alternative has been selected.

Routine wetland delineation data sheets were completed in the field for each numbered wetland and an adjacent upland from sampled test plots (see Appendix C). Data recorded included dominant vegetation, hydrologic indicators, and hydric soil indicators. Mapped soil types were documented using the NRCS soil surveys and were used to support soil profile descriptions in the field. Hydric soil indicators were assessed using the *Field Indicators of Hydric Soils in the United States* (USDA 1998). Soil color was identified using the *Munsell Color Chart* handbook (Munsell 1975). The wetland indicator status of the observed vegetation was identified using the *National List of Plant Species That Occur in Wetlands: Region 1 – Northeast* (USFWS 1988). Perennial and intermittent waterways were assessed using a stream features data sheet (see Appendix C. All identified wetlands and waterways were also classified according to the methods established in *A Classification of Wetland and Deep-Water Habitats in the United States* (Cowardin et. al. 1979).

Wetland functions and values were assessed using the New England Method for all wetlands larger than one-half acre and recorded on Wetland Function-Value Evaluation Forms (Appendix D). The functions and values assessed for these wetlands include groundwater recharge/discharge, floodflow alteration, fish and shellfish habitat, sediment toxicant retention, nutrient removal, production export, sediment/shoreline stabilization, wildlife habitat, recreation, educational scientific value, uniqueness/heritage, visual quality/aesthetics, and endangered species.

2.6.2. Existing Conditions

During the field investigation, 56 waters of the United States, including wetlands, were identified. The locations of these systems are generally shown in **Figure 2-5**, and shown in detail in Appendix E. The characteristics and details of each numbered system are shown in **Table 2-10.**

Bethesda/Chevy Chase Segment

Wetland GB-1 is located along the Georgetown Branch hiker-biker trail between Montgomery Avenue and Elm Street. This system includes a tributary to Coquelin Run and adjacent fringe wetlands. The stream is classified as riverine intermittent with a sand substrate (R4SB4). The channel width of the stream is 1.5 feet with a depth of 2 feet. During the site visit, there was less than 1 inch of water in the channel. The stream is channelized for most of its length along the north side of the trail. In-stream habitat is very low due to shallow flows. A point source discharge into the stream from an adjacent building was observed during the site review. The riparian zone is composed of commercial and residential buildings with a narrow swath of forest. Dominant species within the forested zone included scattered specimens of *Acer negundo* (box elder). The forested riparian buffer provides 50 percent shading to the stream.

The wetland is classified as palustrine persistent emergent with a temporarily flooded water regime (PEM1A). During the site visit, the wetland was inundated with up to 2 inches of water, and soils were saturated to the surface. Other indicators of hydrology included drainage patterns. Water was also present to the surface of an unlined bore hole. Dominant vegetation in the wetland included *Polygonum periscaria* (lady's thumb) and *Impatiens capensis* (jewelweed). One hundred percent of the dominant plant species met the hydrophytic vegetation criteria. The hydric soil criteria were met within 3 and 12 inches of the soil profile with a low chroma matrix color of 2.5Y3/1.

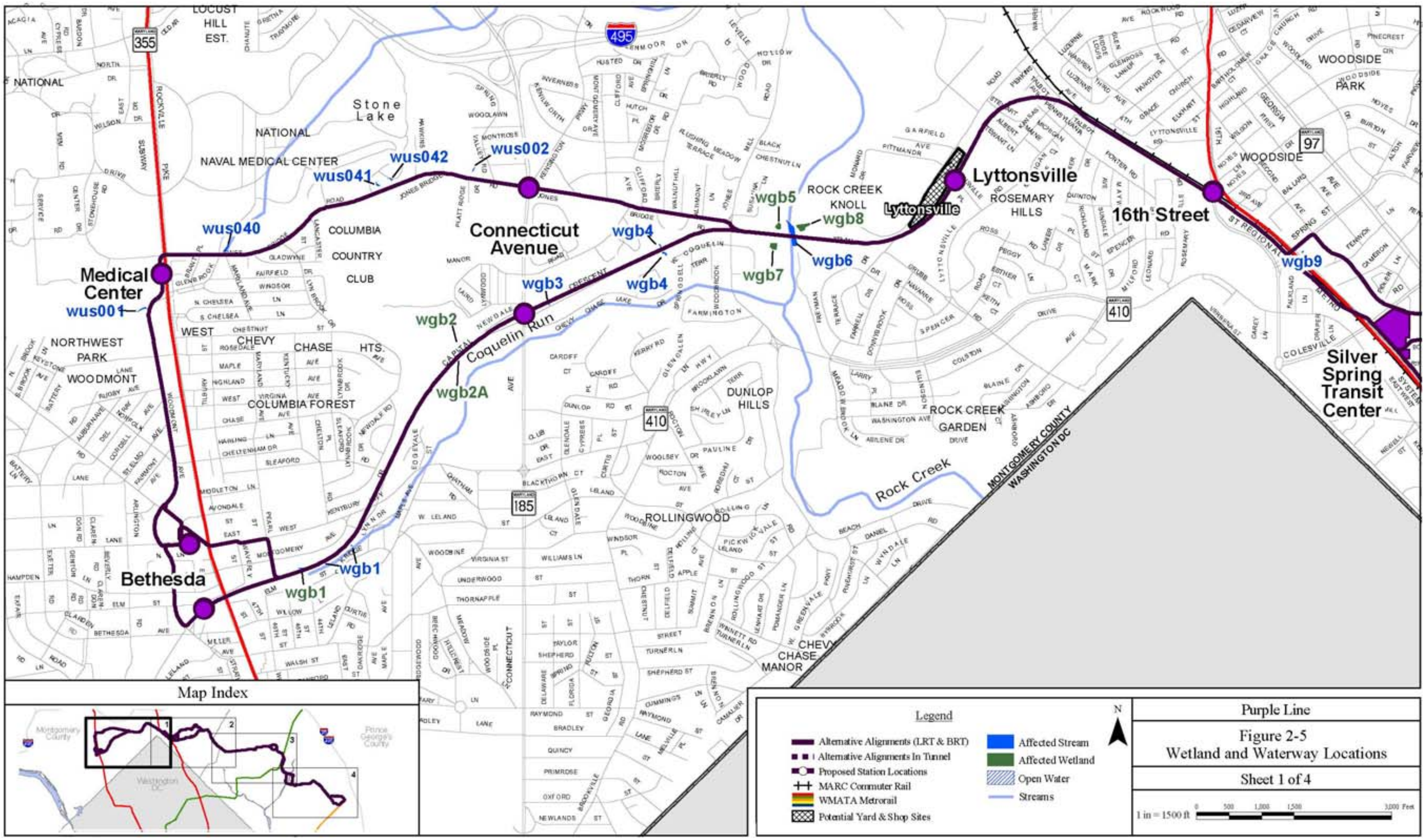

Figure 2-5: Wetland and Stream Location

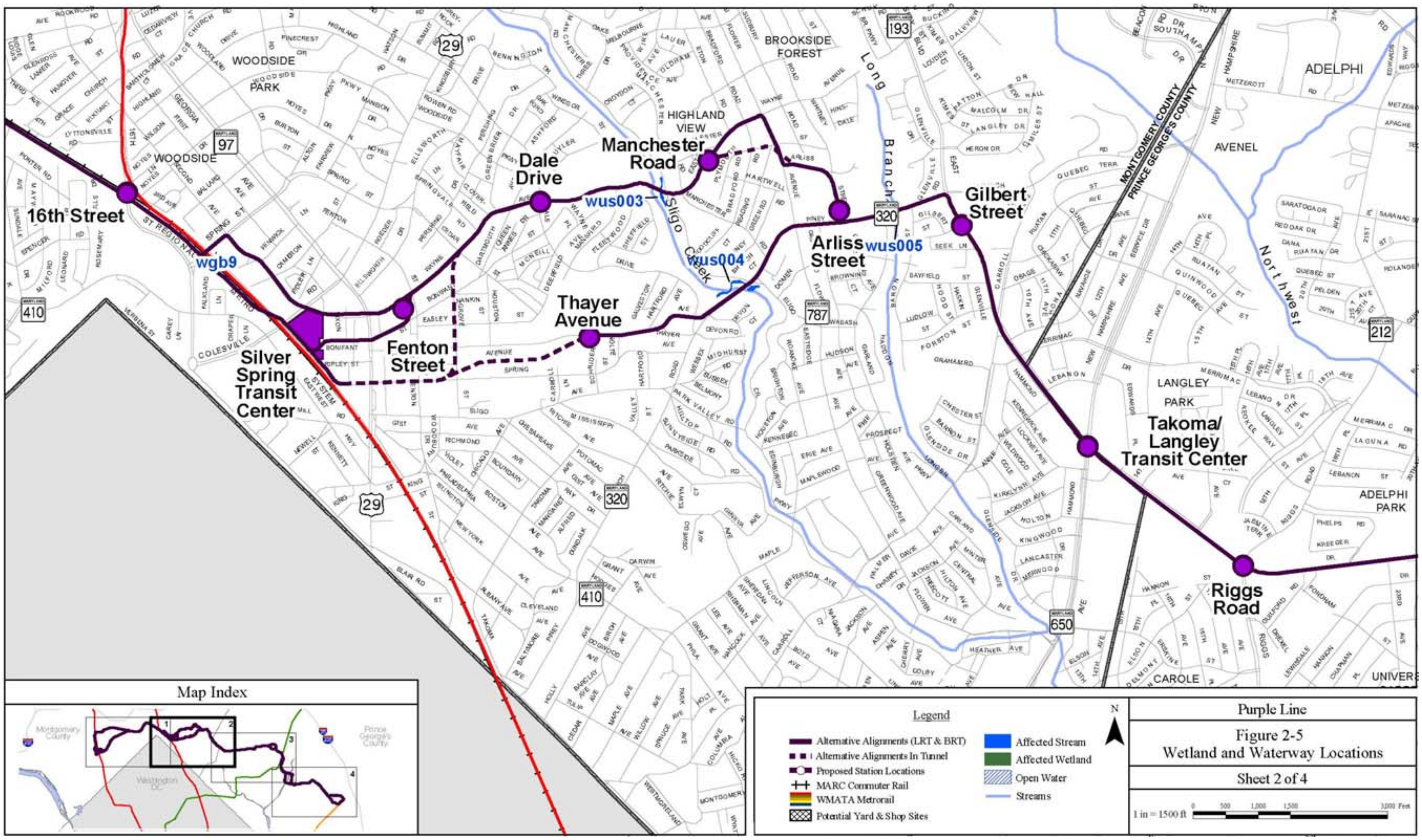

Figure 2-5: Wetland and Stream Location (continued)

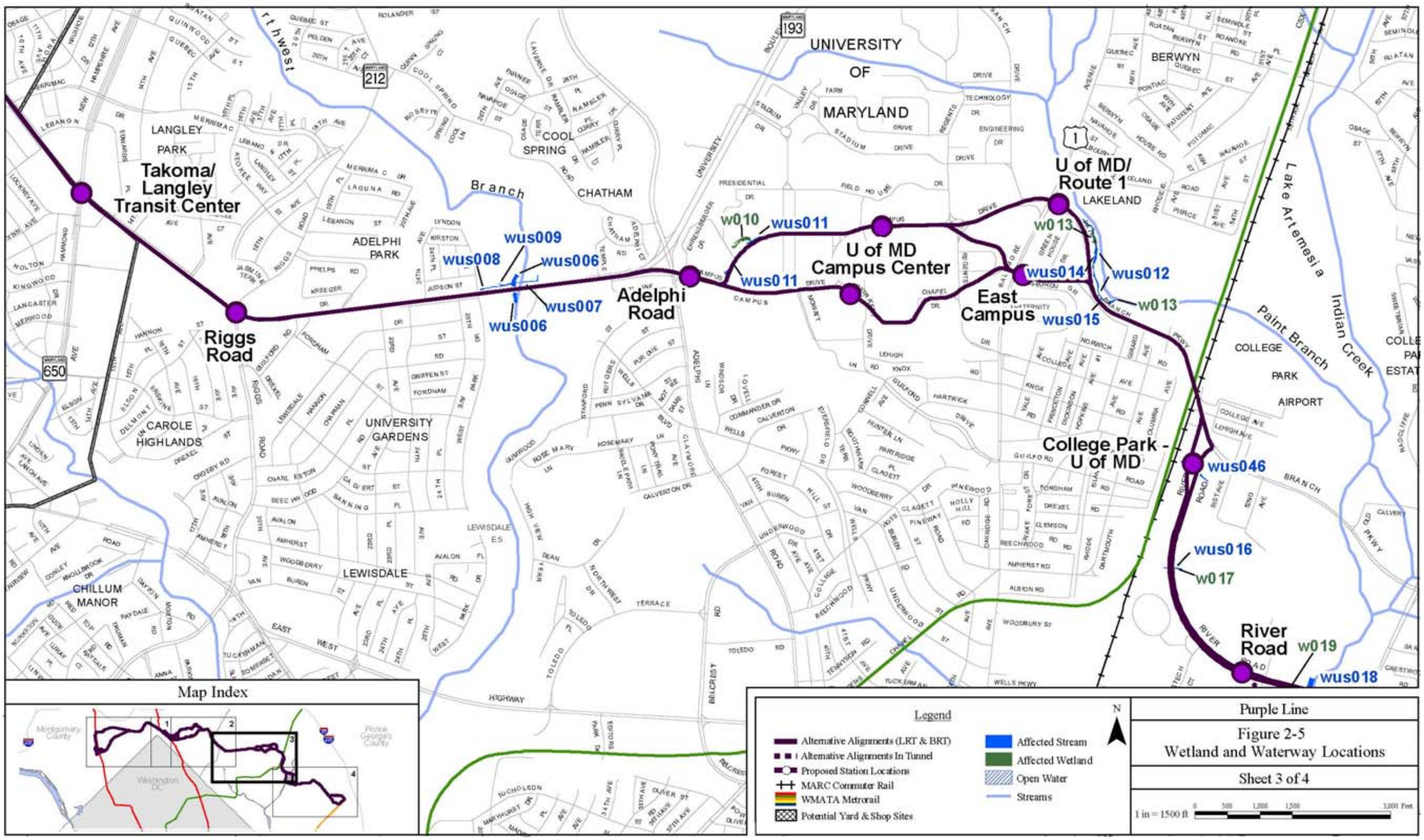

Figure 2-5: Wetland and Stream Location (continued)

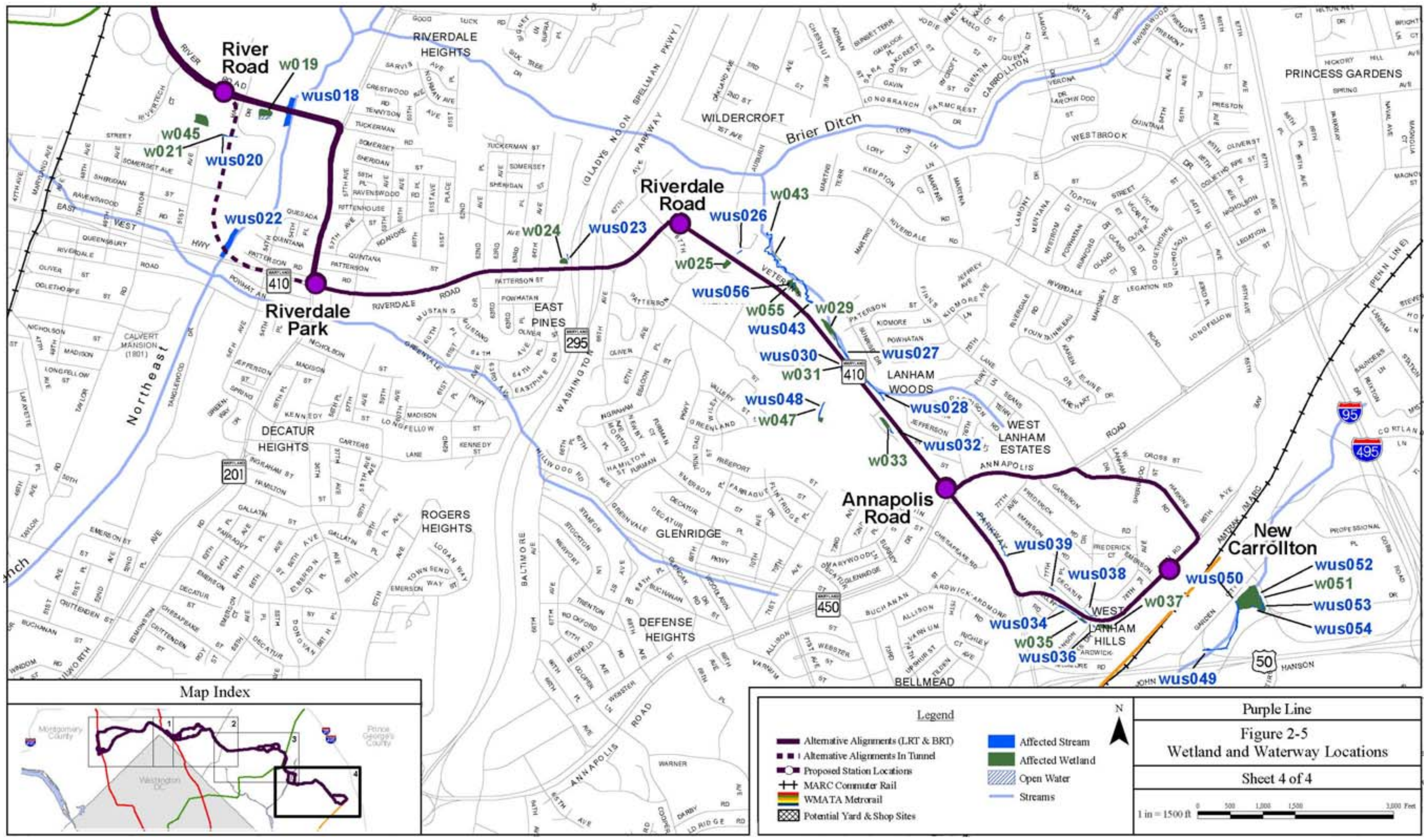

Figure 2-5: Wetland and Stream Location (continued)

Table 2-10: Waters of the United States, including Wetlands, within the Corridor

System Number	Cowardin Classification	Hydrology	Vegetation: Common name	Vegetation: Scientific Name	Vegetation: Indicator Status	Soils*	Principal Functions **
Wetland GB-1	R4SB4	Intermittent stream	N/A	N/A	N/A	N/A	N/A
	PEM1A	Inundated Drainage patterns	lady's thumb jewelweed sedge	*Polygonum persicaria* *Impatiens capensis* *Carex* sp.	FACW FACW	**Urban Land** 0-2" Muck 3-12" 2.5Y3/1 sil	N/A
Wetland GB-2	R4SB4	Intermittent stream	N/A	N/A	N/A	N/A	N/A
	PEM1A	Saturated in upper 12" Drainage patterns	smartweed species false-nettle reed canarygrass fescue	*Polygonom* sp. *Boehmeria cylindrica* *Phalaris arundinacea* *Festuca* sp.	 FACW+ FACW+	**Urban Land** 0-12" 2.5Y3/2 sand/ alluvium with gravel	N/A
Wetland GB-2A	PFO1A	Drainage patterns	jewelweed smartweed species northern spicebush honeysuckle shallow sedge box elder rice cutgrass goldenrod	*Impatiens capensis* *Polygonum* sp. *Lindera benzoin* *Lonicera* sp. *Carex lurida* *Acer negundo* *Leersia oryzoides* *Solidago* sp.	FACW FACW- FACU OBL FAC+ OBL	**Urban Land** 0-7" 10YR3/1 sil 7-14" 2.5Y3/2 w/ 2.5Y5/6 redox; fsl	N/A
Wetland GB-3	R4SB3	Intermittent stream	N/A	N/A	N/A	N/A	N/A
Wetland GB-4	R4SB4	Intermittent stream	N/A	N/A	N/A	N/A	N/A
Wetland GB-5	PFO1A	Drainage patterns Oxidized root channels	northern spicebush jewelweed river birch silver maple multiflora rose green ash fowl mannagrass	*Lindera benzoin* *Impatiens capensis* *Betula nigra* *Acer saccharinum* *Rosa multiflora* *Faxinus pennsylvanica* *Glyceria striata*	FACW- FACW FACW FACW FACU FACW OBL	**Codorus silt loam** 0-6" 10YR4/1 w/ 10YR3/6 redox; sil 6-10" 2.5Y4/2 w/ 7.5YR4/6 redox; sil 10-12+" 2.5Y4/2 w/ 7.5YR4/6 redox; sil w/ loose gravel	N/A

Table 2-10: Waters of the United States, including Wetlands, within the Corridor

System Number	Cowardin Classification	Hydrology	Vegetation			Soils*	Principal Functions **
			Common name	Scientific Name	Indicator Status		
Wetland GB-6	R2SB1	Lower perennial stream	N/A	N/A	N/A	N/A	N/A
Wetland GB-7	PFO1A	Drainage patterns Water-stained leaves	red maple stout wood-reedgrass northern spicebush silver maple box elder American elm small-spike false-nettle jewelweed	*Acer rubrum* *Cinna arundinacea* *Lindera benzoin* *Acer saccharinum* *Acer negundo* *Ulmus americana* *Boehmeria cylindrica* *Impatiens capensis*	FAC FACW+ FACW- FACW FACW FAC+ FACW+ FACW	**Codorus silt loam** 0-6" 2.5Y5/2 w/ 10YR5/8 redox; sil 2.5Y4/2 and 2.5Y7/4 w/ 7.5YR4/6 redox; sil 12+" 2.5Y5/4 w/ 7.5YR4/6 redox; sil	N/A
Wetland GB-8	PFO1A	Drift lines Sediment deposits Drainage patterns Water-stained leaves	box elder green ash stout wood-reedgrass northern spicebush red maple	*Acer negundo* *Fraxinus pennsylvanica* *Cinna arundinacea* *Lindera benzoin* *Acer rubrum*	FACW FACW FACW+ FACW- FAC	**Codorus silt loam** 0-5" 2.5Y4/1 w/ 10YR3/6 redox; sil 5-10" 10YR4/1 w/ 10YR4/6 redox; sil 10-16" 10YR4/1 w/ 7.5YR4/4 redox; sil	FA FSH STR NR PE S/SS WH R ESV
Wetland GB-9	R4SB4	Intermittent stream	N/A	N/A	N/A	N/A	N/A
WUS-001	R2UB1	Lower perennial stream	N/A	N/A	N/A	N/A	N/A
WUS-002	R4SB4	Intermittent stream	N/A	N/A	N/A	N/A	N/A
WUS-003	R3UB1	Upper perennial stream	N/A	N/A	N/A	N/A	N/A
WUS-004	R3UB1/2	Upper perennial stream	N/A	N/A	N/A	N/A	N/A
WUS-005	R3UB1/2	Upper perennial stream	N/A	N/A	N/A	N/A	N/A

Table 2-10: Waters of the United States, including Wetlands, within the Corridor

System Number	Cowardin Classification	Hydrology	Vegetation			Soils*	Principal Functions **
			Common name	Scientific Name	Indicator Status		
WUS-006	R2UB2	Lower perennial stream	N/A	N/A	N/A	N/A	N/A
WUS-007	R2UB2	Lower perennial stream	N/A	N/A	N/A	N/A	N/A
WUS-008	R4SB4	Intermittent stream	N/A	N/A	N/A	N/A	N/A
WUS-009	R4SB3/4	Intermittent stream	N/A	N/A	N/A	N/A	N/A
W010	PEM2E	Saturated in upper 12" Oxidized root channels	common rush wool-grass goldenrod slender rush blunt spikerush shallow sedge marsh seedbox	*Juncus effusus* *Scirpus cyperinus* *Solidago* sp. *Juncus tenuis* *Eleocharis obtusa* *Carex lurida* *Ludwigia palustris*	FACW+ FACW+ FAC- OBL OBL OBL	**Iuka silt loam** 0-2" 10YR4/2 2-4" 5Y7/1 w/ 10YR5/6 redox; scl 4+" 10YR7/1 w/ 7.5YR5/8 redox; scl	N/A
WUS-011	R4SB2x	Intermittent stream	N/A	N/A	N/A	N/A	N/A
WUS-012	R2UB1/2x	Lower perennial stream	N/A	N/A	N/A	N/A	N/A
W013	PFO1C	Saturated in upper 12" Drainage patterns	American sycamore river birch false nettle spicebush jewelweed Asiatic tearthumb multiflora rose	*Platanus occidentalis* *Betula nigra* *Boehmeria cylindrica* *Lindera benzoin* *Impatiens capensis* *Polygonum perfoliatum* *Rosa multiflora*	FACW- FACW FACW+ FACW- FACW FAC* FACU	**Hatboro silt loam** 0-4" 10YR2/1 4-8" 2.5Y5/3 w/ 10YR5/8 redox; sl 8+" 10YR3/2 w/ 10YR5/8 redox; fsl	N/A

Table 2-10: Waters of the United States, including Wetlands, within the Corridor

System Number	Cowardin Classification	Hydrology	Vegetation			Soils*	Principal Functions **
			Common name	Scientific Name	Indicator Status		
W013	PEM1E	Saturated in upper 12” Water stained leaves	fringed sedge false nettle green bulrush pointed broom sedge arrowleaf tearthumb owlfruit sedge marshpepper smartweed	*Carex crinita* *Boehmeria cylindrica* *Scirpus atrovirens* *Carex scoparia* *Polygonum sagittatum* *Carex stipata* *Polygonum hydropiper*	OBL FACW+ OBL FACW OBL OBL OBL	**Hatboro silt loam** 0-5” 10YR3/2 w/ 10YR4/6 redox; sicl 5-10” 10YR3/1 w/ 10YR3/6 redox; sicl 10-12” 10YR4/2 w/ 10YR3/6 redox; scl 12+” 2.5Y4/2 w/ 2.5Y5/6 redox; sl	N/A
WUS-014	R2UB2	Lower perennial stream	N/A	N/A	N/A	N/A	N/A
WUS-015	R2UBx	Lower perennial stream	N/A	N/A	N/A	N/A	N/A
WUS-016	R4SB3/4	Intermittent stream	N/A	N/A	N/A	N/A	N/A
W017	PSS1E	Saturated in upper 12” Drainage patterns Water stained leaves	arrowhead black willow American elm thoroughwort false nettle Pennsylvania smartweed sedge	*Sagittaria* sp. *Salix nigra* *Ulmus americana* *Eupatorium* sp. *Boehmeria cylindrica* *Polygonum pensylvanicum* *Carex* sp.	 FACW+ FACW+ FACW 	**Beltsville silt loam** 0-2” organics 2+” 10YR2/1	N/A
WUS-018	R2UB1/2	Lower perennial stream	N/A	N/A	N/A	N/A	N/A
W019	POW w/PEM1/2H fringe	Inundated Saturated in upper 12”	broadleaf cattail common rush broadleaf arrowhead	*Typha latifolia* *Juncus effusus* *Sagittaria latifolia*	OBL FACW+ OBL	**Hatboro silt loam** Hydric soils assumed based on long duration inundation	N/A
WUS-020	R2UB1/2	Lower perennial stream	N/A	N/A	N/A	N/A	N/A

Table 2-10: Waters of the United States, including Wetlands, within the Corridor

System Number	Cowardin Classification	Hydrology	Vegetation: Common name	Vegetation: Scientific Name	Vegetation: Indicator Status	Soils*	Principal Functions **
W021	PFO1A	Saturated in upper 12”	red maple multiflora rose Japanese honeysuckle small-spike false nettle fowl manna grass	*Acer rubrum* *Rosa multiflora* *Lonicera japonica* *Boehmeria cylindrica* *Gylceria striata*	FAC FACU FAC- FACW+ OBL	**Hatboro silt loam** 0-2” 10YR3/2 w/ 10YR4/6 redox; cl 2-4” 10YR4/1 w/ 7.5YR4/6,4 redox; cl w/rootlets 4+” 10YR4/1 w/ 7.5YR4/6 redox; cl w/coarse gravel	N/A
WUS-022	R2UB1/2	Lower perennial stream	N/A	N/A	N/A	N/A	N/A
WUS-023	R4SB3/4	Intermittent stream	N/A	N/A	N/A	N/A	N/A
W024	PEM1H	Inundated Saturated in upper 12” Oxidized root channels Water-stained leaves	broadleaf cattail lesser duckweed common water hyacinth common rush rice cutgrass	*Typha latifolia* *Lemna minor* *Eichornia crassipes* *Juncus effusus* *Leersia oryzoides*	OBL OBL OBL FACW+ OBL	**Sunnyside-Urban land complex** 0-2” organics Fill to 12+” 5YR4/6 & 7.5YR4/6 redox; sc	N/A
W025	POW w/PSS2H	Inundated Saturated in upper 12” Water marks	black willow common buttonbush broadleaf arrowhead common rush	*Salix nigra* *Cephalanthus occidentalis* *Sagittaria latifolia* *Juncus effusus*	FACW+ OBL OBL FACW+	**Sunnyside fine sandy loam** Hydric soils assumed based on long duration inundation	N/A
WUS-026	R4SBx	Intermittent stream	N/A	N/A	N/A	N/A	N/A
WUS-027	R2UB1/2 R4SB3/4	Intermittent to lower perennial stream	N/A	N/A	N/A	N/A	N/A
WUS-028	R4SB4	Intermittent stream	N/A	N/A	N/A	N/A	N/A

Table 2-10: Waters of the United States, including Wetlands, within the Corridor

System Number	Cowardin Classification	Hydrology	Vegetation: Common name	Vegetation: Scientific Name	Vegetation: Indicator Status	Soils*	Principal Functions **
W029	PEM1E/ PSS1E	Saturated in upper 12” Oxidized root channels	common rush jewelweed shallow sedge rice cutgrass arrowleaf tearthumb lateflowering thoroughwort deertongue witchgrass great ragweed bush clover common elderberry spotted joe pye weed reed canary grass black willow marsh seedbox	*Juncus effusus* *Impatiens capensis* *Carex lurida* *Leersia oryzoides* *Polygonum sagittatum* *Eupatorium serotinum* *Dichanthelium clandestinum* *Ambrosia trifida* *Lespedeza* sp. *Sambucus nigra canadensis* *Eupatoriadelphus maculatus* *Phalaris arundinacea* *Salix nigra* *Ludwigia palustris*	FACW+ FACW OBL OBL OBL FAC- FACW+ FAC FACW- FACW FACW+ FACW+ OBL	**Bibb silt loam** 0-10” 10YR4/2 w/ 7.5YR4/6 redox; sicl 10+” 10YR4/2 w/ 5YR4/6 redox; scl	N/A
WUS-030	R4SBx	Intermittent stream	N/A	N/A	N/A	N/A	N/A
W031	PEM1A	Saturated in upper 12”	broadleaf cattail marsh seedbox deertongue witchgrass shallow sedge common rush common boneset fowl mannagrass green bulrush goldenrod fox sedge	*Typha latifolia* *Ludwigia palustris* *Dichanthelium clandestinum* *Carex lurida* *Juncus effusus* *Eupatorium perfoliatum* *Glyciera striata* *Scirpus atrovirens* *Solidago* sp. *Carex vulpinoidea*	OBL OBL FACW+ OBL FACW+ FACW+ OBL OBL OBL	**Sunnyside fine sandy loam** 0-8” 10YR4/3 w/ 7.5YR 4/6 redox; scl	N/A
WUS-032	R4SBx	Intermittent stream	N/A	N/A	N/A	N/A	N/A

Table 2-10: Waters of the United States, including Wetlands, within the Corridor

System Number	Cowardin Classification	Hydrology	Vegetation: Common name	Vegetation: Scientific Name	Vegetation: Indicator Status	Soils*	Principal Functions **
W033	PEM1E	Water marks	broadleaf cattail common rush spotted lady's thumb New York ironweed softstem bulrush	*Typha latifolia* *Juncus effusus* *Polygonum persicaria* *Vernonia noveboracensis* *Schoenoplectus tabernaemontani*	OBL FACW+ FACW FACW+ OBL	**Bibb silt loam** Fill w/redox	N/A
WUS-034	R4SB4x	Intermittent stream	N/A	N/A	N/A	N/A	N/A
W035	PEM1E	Saturated in upper 12"	jewelweed false nettle broadleaf cattail Asiatic tearthumb spotted joe pye weed shallow sedge	*Impatiens capensis* *Boehmeria cylindrica* *Typha latifolia* *Polygonum perfoliatum* *Eupatoriadelphus maculatus* *Carex lurida*	FACW FACW+ FACW+ FAC* FACW OBL	**Bibb silt loam** 0-2" 10YR3/2; sil 2-8" 10YR3/2 w/ 7.5YR4/6 redox; sil 8+" 10YR3/2 w/ 7.5YR4/6 redox; sicl	N/A
WUS-036	R4SBx	Intermittent stream	N/A	N/A	N/A	N/A	N/A
W037	PEM1H	Inundated	wand lythrum common reed broadleaf arrowhead common rush goldenrod	*Lythrum lineare* *Phragmites australis* *Sagittaria latifolia* *Juncus effusus* *Solidago* sp.	OBL FACW OBL FACW+	**Bibb silt loam** Hydric soils assumed based on long duration inundation	N/A
WUS-038	R4SB4x	Intermittent stream	N/A	N/A	N/A	N/A	N/A
WUS-039	R4SB4x	Intermittent stream	N/A	N/A	N/A	N/A	N/A
WUS-040	R2UB1/2	Lower perennial stream	N/A	N/A	N/A	N/A	N/A
WUS-041	R4SB4	Intermittent stream	N/A	N/A	N/A	N/A	N/A
WUS-042	R4SB4	Intermittent stream	N/A	N/A	N/A	N/A	N/A
WUS-043	R2UB1/2	Lower perennial stream	N/A	N/A	N/A	N/A	N/A

Table 2-10: Waters of the United States, including Wetlands, within the Corridor

System Number	Cowardin Classification	Hydrology	Vegetation: Common name	Vegetation: Scientific Name	Vegetation: Indicator Status	Soils*	Principal Functions **
W044	PFO1C	Drainage patterns Water-stained leaves	sweetgum red maple willow oak New York fern tapered rosette grass deertongue witchgrass common greenbrier	*Liquidambar styraciflua* *Acer rubrum* *Quercus phellos* *Thelypteris noveboracensis* *Dichanthellium acuminatum* *Dichanthelium clandestinum* *Smilax rotundifolia*	FAC FAC FAC+ FAC FAC FAC+ FAC	**Bibb silt loam** 0-2" 10YR4/2; sicl 2-6" 10YR4/2 w/ 7.5YR2.5/3 redox; sicl 6+" 10YR4/2 w/ 10YR5/8 redox; sicl	N/A
W045	PFO1E	Saturated in upper 12" Drainage patterns Water-stained leaves	lizard's tail small-spike false nettle fowl mannagrass red maple lady's thumb	*Saururus cernuus* *Boehmeria cylindrica* *Glyceria striata* *Acer rubrum* *Polygonum persicaria*	OBL FACW+ OBL FAC FACW	**Bibb silt loam** 0-2" 10YR4/3 w/ 7.5YR4/6 redox; sicl 2-8" 10YR4/2 w/ 7.5YR4/6 redox; sicl 8+ 10YR5/2 w/ 7.5YR5/8,4/6 redox	GR/D FA STR NR S/SS
WUS-046	R2UB1/2	Lower perennial stream	N/A	N/A	N/A	N/A	N/A
W047	PSS1H	Inundated Saturated in upper 12" Water-stained leaves	broadleaf cattail river birch black willow broadleaf arrowhead false nettle	*Typha latifolia* *Betula nigra* *Salix nigra* *Sagittaria latifolia* *Boehmeria cylindrica*	OBL FACW FACW+ OBL FACW+	Hydric soils assumed based on long duration inundation	N/A
WUS-048	R4SBx	Intermittent stream	N/A	N/A	N/A	N/A	N/A
WUS-049	R2UB2	Lower perennial stream	N/A	N/A	N/A	N/A	N/A
WUS-050	R2UB2	Lower perennial stream	N/A	N/A	N/A	N/A	N/A

Table 2-10: Waters of the United States, including Wetlands, within the Corridor

System Number	Cowardin Classification	Hydrology	Vegetation: Common name	Vegetation: Scientific Name	Vegetation: Indicator Status	Soils*	Principal Functions **
W051	PSS1E	Saturated in upper 12" Drainage patterns	black willow broadleaf arrowhead Pennsylvania smartweed marshpepper knotweed swamp smartweed strawcolored flatsedge common elderberry purple loosestrife	*Salix nigra* *Sagittaria latifolia* *Polygonum pennsylvanicum* *Polygonum hydropiper* *Polygonum hydropiperoides* *Cyperus strigosus* *Sambucus nigra canadensis* *Lythrum salicaria*	FACW+ OBL FACW OBL OBL FACW FACW- FACW+	**Bibb silt loam** 0-4" 10YR3/2; sicl w/organics 4-6" 10YR3/2 w/ 7.5YR3/4 redox; sicl 6+" fill	GR/D FA FSH STR NR PE S/SS WH
W051		Inundated Saturated in upper 12" Water-stained leaves	broadleaf cattail swamp smartweed rice cutgrass false nettle common buttonbush black willow porcelain berry softstem bulrush	*Typha latifolia* *Polygonum hydropiperoides* *Leersia oryzoides* *Boehmeria cylindrica* *Cephalanthus occidentalis* *Salix nigra* *Ampelopsis brevipedunculata* *Schoenoplectus tabernaemontni*	OBL OBL OBL FACW+ OBL FACW+	**Bibb silt loam** 0-3" 2.5Y3/1; sicl 3-6" 2.5Y4/2 w/ 10YR3/6 redox; sicl 6+" 7.5YR5/4 w/ 7.5YR5/8 redox: cl	N/A
WUS-052	R2UB3	Lower perennial stream	N/A	N/A	N/A	N/A	N/A
WUS-053	R4SB4	Intermittent stream	N/A	N/A	N/A	N/A	N/A
WUS-054	R4SB4	Intermittent stream	N/A	N/A	N/A	N/A	N/A

Table 2-10: Waters of the United States, including Wetlands, within the Corridor

System Number	Cowardin Classification	Hydrology	Vegetation: Common name	Vegetation: Scientific Name	Vegetation: Indicator Status	Soils*	Principal Functions **
W055	PSS1E	Saturated in upper 12" Drainage patterns Water present at 10" unlined bore hole	black willow brook-side alder rice cutgrass common boneset broadleaf cattail lady's thumb late-flowering thoroughwort beggar-ticks softstem bulrush	*Salix nigra* *Alnus serrulata* *Leersia oryzoides* *Eupatorium perfoliatum* *Typha latifolia* *Polygonum persicaria* *Eupatorium serotinum* *Bidens* sp. *Schoenoplectus tabernaemontani*	FACW+ OBL OBL FACW+ OBl FACW FAC-	**Bibb silt loam** 0-5" 10YR4/6 w/ 10YR5/8 redox; sic 5-8" 5Y4/2 w/ 10YR5/6 redox; sicl 8+" 5Y3/1 w/10YR5/6 redox; csl	GR/D FA FSH STR NR PE S/SS WH VQ/A
WUS-056	R2UB3	Lower perennial stream	N/A	N/A	N/A	N/A	N/A

* cl - clay loam
fsl - fine sandy loam
sc - sandy clay
scl - sandy clay loam
sicl - silty clay loam
sil - silt loam

** GR/D - Groundwater Recharge/Discharge
FA - Floodflow Alteration
FSH- Fish and Shellfish Habitat
STR - Sediment Toxicant Retention
NR - Nutrient Removal
PE - Production Export
S/SH- Sediment/Shoreline Stabilization
WH - Wildlife Habitat
R - Recreation
ESV- Educational Scientific Value
VQ/A - Visual/Quality/Aesthetics

Wetland GB-2 is on the west side of the Columbia Country Club, north of the trail. This system includes a stream and a fringe wetland. The stream is classified as riverine intermittent with a sand substrate (R4SB4). The channel width of the stream is 4 feet with a depth of 3.5 feet. During the site visit, there was less than 1 inch of water within the channel. The stream is channelized near the culvert as it flows south under the trail. In-stream habitat complexity is very low due to shallow flows. The riparian zone of the stream is comprised of maintained lawn grasses due to its location within the golf course.

A narrow wetland fringe along the stream is classified as a palustrine persistent emergent wetland with a temporarily flooded water regime (PEM1A). During the site visit, soils were saturated to the surface and drainage patterns were present within the wetland. Water was also present at 2 inches below the ground surface in an unlined bore hole. Dominant vegetation in the wetland included *Boehmeria cylindrica* (false nettle), *Phalaris arundinacea* (reed canarygrass), and *Festuca* sp. (fescue). Sixty-six percent of the dominant plant species met the hydrophytic vegetation criteria. The hydric soil criteria were met between zero and 12 inches of the soil profile with a low chroma matrix of 2.5Y3/2.

Wetland GB-2A is located west of Wetland System 2 on the north side of the trail. This isolated area is classified as a palustrine broad-leaved deciduous forested wetland with a temporarily flooded water regime (PFO1A). During the site visit, drainage patterns were observed in the wetland. Dominant vegetation in the wetland included box elder, *Fraxinus pennsylvanica (*green ash), *Lindera benzoin* (northern spicebush), *Carex lurida* (shallow sedge), and *Leersia oryzoides* (rice cutgrass). One-hundred percent of the dominant plant species met the hydrophytic vegetation criteria. The hydric soil criteria were met between 0 and 7 inches of the soil profile with a low chroma matrix of 10YR3/1.

Wetland GB-3 is a riverine intermittent stream with a gravel substrate (R4SB3) that flows south under the trail, east of MD 185 (Connecticut Avenue). The average channel width of the stream is 15 feet with a depth of 1.5 feet. During the site visit, there was no water present within the channel. The stream is channelized near the culvert and is eroding around the headwall. In-stream habitat is very low due to lack of flow. The riparian zone of the stream is comprised of commercial buildings and a hiker-biker trail. A portion of the buffer is forested with dominant species of box elder and *Acer rubrum* (red maple), providing 80 percent shading to the channel.

Wetland GB-4 is a tributary to Coquelin Run that flows south through the corridor. This portion of the stream is classified as riverine intermittent with sand substrate (R4SB4). The average channel width of the stream is 15 feet with a depth of 4 feet. The culvert is currently being undermined due to the severe erosion occurring within the stream. In-stream habitat complexity is low due to the flashy or intermittent flows and significant erosion. The riparian buffer of the stream is characterized by forest and residential areas. The dominant species within the forested buffer include box elder, *Rosa multiflora* (multiflora rose), northern spicebush, and *Robinia pseudoacacia* (black locust), providing 80 percent shading to the channel.

Wetland GB-5 is located east of Jones Mill Road on the north side of the Georgetown Branch trail. This isolated wetland is classified as a palustrine broad-leaved deciduous forested wetland

with a temporarily flooded water regime (PFO1A). During the site visit, drainage patterns were observed in the wetland. Oxidized root channels were also present in the upper 12 inches of the soil profile. Dominant vegetation in the wetland included *Betula nigra* (river birch), *Acer saccharinum* (silver maple), multiflora rose, northern spicebush, green ash, jewelweed, and rice cutgrass. Eighty-six percent of the dominant plant species met the hydrophytic vegetation criteria. The hydric soil criteria were met between 0 and 6 inches of the soil profile with a low chroma matrix color of 10YR4/1.

Wetland GB-6 is the main stem of Rock Creek that flows under the Georgetown Branch Trail. This stream is classified as riverine lower perennial with an unconsolidated bottom of cobble/gravel (R2UB1). The average channel width of the stream is 60 feet with a depth of 5 feet. During the site visit, the average water depth was 1.5 feet. The stream has been channelized to flow under the trail, and a bridge pier is in the center of the stream. In-stream habitat complexity is characterized by large areas of deep pools with limited cover and little riffle-pool sequence. Silt deposition is heavy, and bank erosion is moderate to severe. The riparian buffer of the stream consists of *Liriodendron tulipifera* (tulip poplar), green ash, *Ulmus americana* (American elm), red maple, and *Platanus occidentalis* (American sycamore), providing approximately 10 percent shading to the stream.

Wetland GB-7 is located east of Jones Mill Road on the south side of the Georgetown Branch Trail. This isolated wetland is classified as a palustrine broad-leaved deciduous forested wetland with a temporarily flooded water regime (PFO1A). Indicators of hydrology during the site visit included drainage patterns, water-stained leaves, and oxidized root channels in the upper 12 inches of the soil profile. Dominant vegetation in the wetland consisted of red maple, *Cinna arundinacea* (stout wood-reedgrass), northern spicebush, silver maple, box elder, American elm, false nettle, and jewelweed. One-hundred percent of the dominant species met the hydrophytic vegetation criteria. The hydric soil criteria were met between 0 and 6 inches of the soil profile with a low chroma matrix color of 2.5Y5/2.

Wetland GB-8 is located within the floodplain of Rock Creek on the north side of the trail and flows east into the stream via a pipe. The wetland is classified as a palustrine broad-leaved deciduous forest with a temporarily flooded water regime (PFO1A). Indicators of hydrology included drift lines, sediment deposits, drainage patterns, and water-stained leaves. The dominant vegetation in the wetland included box elder, green ash, red maple, spicebush, and stout wood-reedgrass. One-hundred percent of the dominant plant species met the hydrophytic vegetation criteria. The hydric soil criteria were met between 0 and 5 inches of the soil profile with a matrix color of 10YR4/1 and redoximorphic features exhibiting a color of 10YR3/6. The principal functions and values associated with this wetland include floodflow alteration, fish and shellfish habitat, sediment/toxicant retention, nutrient removal, production export, sediment/shoreline stabilization, wildlife habitat, recreation, and educational scientific value.

Waterway WUS001, located on the west side of Woodmont Avenue, is classified as a lower perennial stream with a gravel substrate (R2UB1). This stream flows east into a pipe under the road to join a tributary of Rock Creek. The average channel width of the stream is 4 feet with a depth of 2.5 feet. During the site visit, 3 inches of water were present within the channel. The

habitat complexity of the stream is low due to the lack of overhead cover, high percentage of algae, and channelized nature. The riparian buffer of the stream is primarily mowed grass with scattered specimens of *Cupressocyparis leylandii* (Leyland cypress), green ash, *Morus* sp. (mulberry), and *Salix nigra* (black willow), providing approximately 20 percent shading to the stream.

Waterway WUS002 is the headwaters of an intermittent stream with a sand substrate (R4SB4) that flows north to join a tributary of Rock Creek from the north side of Jones Bridge Road, west of MD 185 (Connecticut Avenue). The average channel width of the stream is 8 feet with a channel depth of 10 feet. During the site visit, there was no water present in the channel. The forest buffer is dominated by *Acer platanoides* (Norway maple), tulip poplar, American sycamore, *Glechoma hederacea* (ground ivy), and *Phyllostachys* sp. (bamboo), providing shading to an average of 95 percent of the stream.

Waterway WUS040, located within the National Naval Medical Center, is classified as a lower perennial stream with a gravel/sand substrate (R2UB1/2). The stream is a tributary to Rock Creek that flows north from Jones Bridge Road, paralleling Gunnell Road. The average channel width is 5 feet with a depth of 2 feet. During the site visit, 3 inches of water were present within the channel. In-stream habitat complexity is low in some areas due to the channelized nature of the stream. However, several clean riffles were present within the stream. Bank erosion is moderate with stream banks that continue to actively erode after being reinforced with rip-rap. The riparian buffer of the stream consists of Gunnell Road along the left bank and a forested buffer on the right bank. The forested buffer is dominated by black locust, *Albizia julibrissiv* (mimosa), and *Ailanthus altissima* (tree-of-heaven). The buffer provides shading to approximately 80 percent of the stream.

Waterway WUS041, located within the National Naval Medical Center, is classified as an intermittent stream with a sand substrate (R4SB4). The stream flows north along Grier Road and has an average channel width of 6.5 inches and a depth of 2 feet. During the site visit, no water was present within the stream. In-stream habitat complexity is low due to shallow flows. Silt deposition is heavy within the stream, especially near the pipe where scour is occurring. The riparian buffer of the stream consists of Grier Road along the right bank and a forested buffer on the left bank. The forested buffer is dominated by red maple, green ash, spicebush, and *Hedera helix* (English ivy). The buffer provides shading to approximately 95 percent of the stream.

Waterway WUS042, located east of WUS041 within the National Naval Medical Center, is classified as an intermittent stream with a sand substrate (R4SB4). The average channel width of the stream is 3 feet with a depth of 2.5 feet. During the site visit, there was no water present within the channel. In-stream habitat complexity is very low due to the lack of water in the channel and shallow flows during the growing season. Erosion is moderate as evidenced by unvegetated, failing banks. The riparian buffer of the stream consists of a road along the right bank of the stream and a fragmented forested buffer on the left bank. The riparian buffer is dominated by black locust, mimosa, and tree-of-heaven. The buffer provides approximately 80 percent shading to the stream.

Silver Spring

Wetland GB-9 is classified as an intermittent stream with a sand substrate (R4SB4) that flows east of Spring Street along the north side of the Metro Red Line tracks. The average channel width is 8 feet with a depth of 4 feet. During the site visit, the average water depth of the stream was 1 inch. Moderate erosion is occurring in the stream as evidenced by undercut banks and a high percentage of silt deposition. The riparian buffer of the stream is comprised of the Metro tracks, commercial buildings, and a narrow forested buffer. The forested area is dominated by box elder and *Polygonum cuspidatum* (Japanese knotweed), providing 95 percent shading to the channel.

Waterway WUS003 is the mainstem of Sligo Creek, which flows through the corridor under Wayne Avenue. This system is classified as an upper perennial stream with a gravel substrate (R3UB1). The stream has an average channel width of 15 feet, a depth of 6 feet, and an average water depth of 1 foot. Stream bank erosion is moderate due to scouring, and silt deposition is moderate due to road runoff. During the site visit, a sewage odor was present within the channel. In-stream habitat is characterized by a few deep pools and some undercut banks. The riparian buffer is dominated by tulip poplar, red maple, and *Smilax* sp. (greenbrier), providing shading to approximately 50 percent of the stream.

Waterway WUS004 is the mainstem of Sligo Creek, which flows south under Piney Branch Road. This portion of the creek is classified as riverine upper perennial with an unconsolidated bottom substrate of gravel/sand substrate (R3UB1/2). The channel width of the stream is 20 feet with an average depth of 6 feet. During the site visit, the average water depth was 6 inches. The forest buffer is dominated by American sycamore, tulip poplar, *Vaccinium corymbosum* (highbush blueberry), and *Lonicera* sp. (honeysuckle), providing shading to approximately 90 percent of the stream.

Waterway WUS005 is the mainstem of Long Branch, which flows south through the corridor under Piney Branch Road. This system is classified as an upper perennial stream with a gravel and sand substrate (R3UB1/2). This stream is approximately 15 feet wide, with a depth of 5 feet. During the site visit, 2 inches of water were present within the channel. The riparian buffer of the stream is dominated by Japanese knotweed, American sycamore, and *Euonymus* sp. (spindletree), providing an average shading of 75 percent to the stream.

University Boulevard

Waterway WUS006 is the mainstem of Northwest Branch, which flows south through the corridor, under University Boulevard. This system is classified as a lower perennial stream with a sand substrate (R2UB2). The average width of the stream is 25 feet with a depth of 5 feet. During the site visit, 6 inches of water were present within the channel. Stream habitat complexity is low to moderate due to an absence of clean riffles and few deep pools. The forest buffer is dominated by multiflora rose, *Alopecurus* sp. (foxtail), *Salix* sp. (willow), and American sycamore, providing shading to an average of 40 percent of the stream.

Waterway WUS007 is classified as a lower perennial stream with a sand substrate (R2UB2). The stream originates east of Adelphi Manor Park and flows west to join Northwest Branch along the north side of University Boulevard. This stream is approximately 5.5 feet wide with a depth of 4 feet. During the site visit, approximately 2 inches of water were present in the channel. The bank erosion is moderate as evidenced by unvegetated banks. Silt deposition is heavy due to in-stream erosion. The stream habitat complexity is low due to the lack of deep pools and clean riffles. The forest buffer is dominated by *Carpinus caroliniana* (ironwood), tulip poplar, red maple, box elder, *Toxicodendron radicans* (poison ivy), and *Bromus arvensis* (field brome), providing shading to approximately 95 percent of the stream.

Waterway WUS008 is classified as an intermittent stream with a sand substrate (R4SB4). The stream flows east from Lyndon Street through Adelphi Manor Park to join Northwest Branch along the north side of University Boulevard. This stream is approximately 3.5 feet wide with a depth of 3 feet. During the site visit, approximately 2 inches of water were present in the channel. Bank erosion is severe in the lower portions of the stream, as evidenced by vertical banks and scour along meanders. Silt deposition is moderate to high in pools, and in-stream habitat complexity is low due to shallow flows. The forest buffer is dominated by green ash and *Paulownia tomentosa* (princess tree), providing shading to approximately 90 percent of the stream.

Waterway WUS009 is classified as an intermittent stream with a gravel and sand substrate (R4SB3/4). The stream originates from a stormwater management pond in the southeast corner of Adelphi Manor Park and flows southeast to waterway WUS-008. This stream has a 2-foot average width with a depth of 2 feet. During the site visit, there was no water in the channel. Little evidence of bank erosion was observed. The stream habitat complexity is low due to shallow flows. The forest buffer is dominated by *Juglans nigra* (black walnut), providing shading to 95 percent of the stream.

UM/College Park

Wetland W010 is a stormwater management wetland that is hydrologically connected to WUS011. This system is classified as a palustrine persistent/nonpersistent emergent wetland with a seasonally flooded/saturated water regime (PEM1/2E). At the time of the field visit, soils were saturated to the surface and oxidized root channels were present in the upper 12 inches of the soil profile. The dominant vegetation in the wetland included *Juncus effusus* (soft rush), *Scirpus cyperinus* (wool-grass), *Solidago* sp. (goldenrod), *Juncus tenuis* (slender rush), *Eleocharis obtusa* (blunt spikerush), shallow sedge, and *Ludwigia palustris* (marsh seedbox). Eighty-six percent of the dominant plant species met the hydrophytic vegetation criteria. The hydric soil criteria were met within 2 and 4 inches of the ground surface. Soil samples within this zone exhibited a low-chroma matrix color of 5Y7/1 with redoximorphic features exhibiting colors of 10YR5/6.

Waterway WUS011 is classified as an intermittent stream with a sand and riprap substrate (R4SB4x). The stream is on the north side of Campus Drive and parallels the west side of President's Drive. The gradient of the stream has been altered by the presence of a water-control structure that was placed in the stream to control stormwater flows in Wetland W010. The

control structure has created a drainage divide that has caused the stream to flow in opposite directions. The stream has an average channel width of 3 feet, with an average depth of 1 foot. During the site visit, 1 inch of water was present in the channel. Little evidence of bank erosion was observed. The stream habitat complexity is low due to extensive riprap and altered hydrology. The forest buffer is dominated by *Liquidambar styraciflua* (sweetgum), poison ivy, *Humulus japonicus* (Japanese hops), and S*alix babylonica* (weeping willow), providing shading to approximately 50 percent of the stream.

Waterway WUS012 is classified as a lower perennial stream with a gravel, sand, and riprap substrate (R2UB1/2x). The stream parallels the north side of Paint Branch Parkway and eventually joins Paint Branch. This stream is approximately 10 feet wide with a depth of 2.5 feet. During the site visit, approximately 2 inches of water were present in the channel. Bank erosion is severe as evidenced by extensive areas of scour and unvegetated banks. Silt deposition is moderate. In-stream habitat is characterized by deep pools with a few undercut banks. The forest buffer is dominated by silver maple, spicebush, *Viola* sp. (violet), and *Polygonum hydropiperoides* (swamp smartweed), providing shading to approximately 95 percent of the stream.

Wetland W013 is a floodplain wetland system associated with WUS012 that includes both forested and emergent wetlands. The forested wetlands are classified as palustrine broad-leaved deciduous with a seasonally flooded water regime (PFO1C). During the site visit, the wetland was saturated at 8 inches below the surface and drainage patterns were observed. Water was present at 8 inches below the ground surface in an unlined bore hole. The dominant vegetation was comprised of American sycamore, river birch, false-nettle, northern spicebush, jewelweed, *Polygonum perfoliatum* (Asiatic tearthumb), and multiflora rose. Eighty-six percent of the dominant plant species met the hydrophytic vegetation criteria. Hydric soil criteria were met within 8 and 12 inches of the ground surface. Soil samples within this zone exhibited a low-chroma matrix color of 10YR3/2 with redoximorphic features exhibiting colors of 10YR5/8.

The emergent wetlands are classified as palustrine nonpersistent with a seasonally flooded/saturated water regime (PEM2E). At the time of the field investigation, soils were saturated to the surface and water-stained leaves were present. Water was present at 10 inches below the ground surface within an unlined bore hole. The dominant vegetation within the wetland included C*arex crinata* (fringed sedge), false nettle, *Scirpus atrovirens* (green bulrush), *Carex scoparia* (pointed broom sedge), *Polygonum sagittatum* (arrowleaf tearthumb), *Carex stipata* (owlfruit sedge), and *Polygonum hydropiper* (marshpepper smartweed). One-hundred percent of the dominant plant species met the hydrophytic vegetation criteria. Hydric soil criteria were met within 5 inches of the ground surface. Soil samples within this zone exhibited a low-chroma matrix color of 10YR3/2 with redoximorphic features exhibiting colors of 10YR4/6.

Waterway WUS014 is classified as a lower perennial stream with a sand substrate (R2UB2). The stream carries runoff from Paint Branch Parkway into WUS012. This stream is approximately 3 feet wide with a depth of 1 foot. During the site visit, approximately 1 inch of water was present in the channel. The bank erosion is minor, and silt deposition is heavy due to

road runoff. The stream habitat complexity is very low due to the short distance the stream travels to its confluence with WUS012. The forest buffer is dominated by American sycamore, spicebush, green ash, and *Phragmites australi*s (common reed), providing shading to approximately 98 percent of the stream.

Waterway WUS015 is classified as a lower perennial stream with a riprap substrate (R2UBx). This stream flows from a pipe along the east side of Paint Branch Parkway in WUS012. The stream is approximately 5 feet wide with a depth of 1 foot. During the site visit, approximately 2 inches of water were present in the channel. Due to the short distance the stream travels between the pipe and the confluence with WUS012, in-stream complexity is low. The forest buffer is dominated by princess tree, Norway maple, and *Rubus* sp. (blackberry), providing shading to approximately 95 percent of the stream.

Riverdale Park

Waterway WUS016 is classified as an intermittent stream with a gravel and sand substrate (R4SB3/4). The stream flows east of the MARC line, under River Road, to eventually join Northeast Branch. The stream is approximately 5 feet deep and 2 feet wide. At the time of the site visit, no water was present in the channel. Little evidence of bank erosion was observed. Silt deposition is moderate due to road runoff. The stream habitat complexity is low due to shallow flows. The forest buffer is dominated by black willow, Ulmus sp. (elm), and red maple, providing shading to approximately 80 percent of the stream.

Wetland W017 is located within the channel of WUS016. This system is classified as a scrub-shrub wetland with broad-leaved deciduous vegetation and a seasonally flooded/saturated water regime (PSS1E). During the site visit, the wetland was saturated to the surface. Other indicators of hydrology include visible drainage patterns and water-stained leaves. Dominant vegetation within the wetland included Sagittaria sp. (arrowhead), black willow, elm, Eupatorium sp. (thoroughwort), false nettle, Polygonum pensylvanicum (Pennsylvania smartweed), and Carex sp. (sedge). One-hundred percent of the dominant plant species met the hydrophytic vegetation criteria. Hydric soils were met at 2 inches below the ground surface. Soil samples within this zone exhibited a low-chroma matrix color of 10YR2/1.

Waterway WUS018 is the mainstem of Northeast Branch, which flows south under River Road. This section of the stream is classified as lower perennial with a gravel and sand substrate (R2UB1/2). The stream is more than 55 feet wide with a depth of 7 feet. During the site visit, approximately 12 inches of water were present in the channel. The stream has been channelized, and a weir has been placed in the stream. Little evidence of bank erosion was observed. Silt deposition is moderate, and a stormwater outfall that drains the adjacent developed areas was observed. Stream habitat complexity is moderate. A riffle is present at the weir, and there is little shading. The forest buffer is dominated by poison ivy, American sycamore, red maple, and Dichanthelium clandestinum (deertongue witchgrass), providing approximately 4 percent shading to the stream.

Wetland W019 is a palustrine open water wetland (POW) with a 5-foot fringe of palustrine persistent/nonpersistent emergent wetland with a permanently flooded water regime (POW w/

PEM1/2H). The wetland was inundated with an unknown depth of water. Dominant vegetation within the wetland included Typha latifolia (broadleaf cattail), common rush, and Sagittaria latifolia (broadleaf arrowhead). One-hundred percent of the dominant plant species met the hydrophytic vegetation criteria. No soil samples were taken due to excessive inundation.

Waterway WUS020 is classified as a lower perennial stream with a mud substrate (R2UB3). The stream flows from the west along the north side of a baseball field within Anacostia River Park, southwest of Haig Drive. This stream is approximately 6.5 feet wide with a depth of 1 foot. During the site visit, approximately 4 inches of water were present in the channel. Little evidence of bank erosion was observed. Silt deposition was heavy due to recent beaver activity. Stream habitat complexity is low due to backwatered flows caused by a beaver dam in the stream. The forest buffer is dominated by Prunus serotina (black cherry), red maple, multiflora rose, Lonicera japonica (Japanese honeysuckle), and Glyceria striata (fowl mannagrass), providing shading to approximately 95 percent of the stream.

Wetland W021 is located within the floodplain of WUS020. This system is classified as a palustrine broad-leaved deciduous forested wetland with a temporarily flooded water regime (PFO1A). At the time of the field investigation, soils were saturated at 6 inches below the ground surface. Dominant vegetation within the wetland included red maple, multiflora rose, Japanese honeysuckle, false nettle, and fowl mannagrass. Sixty percent of the dominant plant species met the hydrophytic vegetation criteria. The hydric soil criteria were met within 2 inches of the ground surface. Soil samples within this zone exhibited a low-chroma matrix color of 10YR3/2 with redoximorphic features exhibiting colors of 10YR4/6.

Waterway WUS022 is the portion of Northeast Branch that flows south under East West Highway. This portion of the stream is classified as a lower perennial stream with a gravel and sand substrate (R2UB1/2). This stream is more than 60 feet wide with a depth of 8 feet. During the site visit, approximately 12 inches of water were present in the channel. The stream has been channelized to the bridge, and riprap lines the west bank. Little evidence of bank erosion was observed. Silt deposition is moderate. In-stream habitat complexity is also moderate with few riffles and some cover for fish. The forest buffer is dominated by Catalpa sp. (catalpa), river birch, American sycamore, poison ivy, multiflora rose, field brome, and Parthenocissus quinquefolia (Virginia creeper), providing approximately 15 percent shading to the stream.

Waterway WUS023 is classified as an intermittent stream with a gravel and sand substrate (R4SB3/4). The stream flows north along the west side of Baltimore Washington Parkway (Baltimore-Washington Parkway), north of Riverdale Road. The west bank of the stream is bordered by Wetland W024. This stream is approximately 3 feet wide with a depth of 2 feet. During the site visit, no water was present in the channel. Little evidence of bank erosion was observed. Stream habitat complexity is very low due to shallow flows. The forest buffer is dominated by red maple, elm, silver maple, catalpa, poison ivy, and multiflora rose, providing approximately 95 percent shading to the stream.

Wetland W024 is a stormwater management wetland that receives runoff from the community of Riverdale Hills, located west of Baltimore Washington Parkway and north of East West

Highway. This wetland is classified as palustrine persistent/nonpersistent emergent with a permanently flooded water regime (PEM1H). This wetland is hydrologically connected to WUS023, overflowing into the stream during rain events. During the site visit, the wetland was inundated with less than 1 inch of water and soils were saturated to the surface. Other indicators of hydrology included oxidized root channels and water-stained leaves. Dominant vegetation in the wetland included broadleaf cattail, Lemna minor (lesser duckweed), Eichornia crassipes (common water hyacinth), common rush, and rice cutgrass. One-hundred percent of the dominant plant species met the hydrophytic vegetation criteria. Soils contained organic matter in the upper 2 inches of the profile. Beyond the first 2 inches of the profile, the soil was comprised of fill material with redoximorphic features exhibiting colors of 5YR4/6 and 7.5YR4/6.

Waterway WUS046 flows south under River Road to eventually join Northeast Branch. This stream is classified as perennial with a gravel and sand substrate (R2UB1/2). The average channel width of the stream is 14 feet with a depth of 4 feet. During the site visit, 8 inches of water was present within the channel. The stream is channelized for most of its length, and the stream banks surrounding the culvert have been reinforced with riprap. In-stream habitat is characterized by undercut banks, woody debris, rootwads, and few deep pools. The parking lot and buildings for the College Park MARC station lie within the riparian buffer of the stream. However, a narrow forested swath exists along the banks of the stream with dominant species of American sycamore, catalpa, elm, Lonicera tatarica (Tatarian honeysuckle), and Japanese honeysuckle. The buffer provides 95 percent shading to the stream.

New Carrollton

Wetland W025 is a stormwater management pond that is hydrologically connected to WUS026 through a pipe that runs under Veterans Parkway. The wetland is south of Veterans Parkway and northeast of Patterson Street. This wetland includes both an open water wetland and a palustrine scrub-shrub wetland supporting broad-leaved deciduous vegetation with a permanently flooded water regime (POW w/PSS2H). During the site investigation, the wetland was inundated with an unknown depth of water and soils were saturated to the surface. Other indicators of hydrology included water marks. Dominant vegetation includes black willow, *Cephalanthus occidentalis* (common buttonbush), broadleaf arrowhead, and common rush. One-hundred percent of the dominant vegetation met the hydrophytic vegetation criteria. Soil samples were not taken due to the excessively flooded condition.

Waterway WUS027 begins as an intermittent stream with a gravel and sand substrate (R4SB3/4) that flows west along the north side of Veterans Parkway and transitions into a lower perennial stream south of Sunrise Drive (R2UB3/4). The stream is approximately 5 feet wide with a depth of 2.5 feet. The stream is generally dry except for a few ponded areas that have an average water depth of 1 inch. Stream bank erosion is moderate as evidenced by undercut banks. Silt deposition is moderate due to two stormwater outfalls. Because of the lack of water flow, stream habitat complexity is low. The forest buffer is dominated by sweetgum, tulip poplar, multiflora rose, and poison ivy, providing shading to approximately 95 percent of the stream.

Waterway WUS028 is classified as an intermittent stream with a sand substrate (R4SB4). The stream carries urban runoff from West Lanham Estates and flows west into WUS027. This

stream has a 6-foot average width and a 4-foot depth. At the time of the site visit, the stream was dry in most areas resulting in an average water depth of less than 1 inch. Bank erosion and silt deposition are both severe due to flashy flows and in-stream erosion. Stream habitat complexity is low due to shallow flows. The forest buffer is dominated by *Nyssa sylvatica* (blackgum), tulip poplar, sweetgum, poison ivy, greenbrier, and *Viburnum* sp. (arrowwood), providing shading to approximately 98 percent of the stream.

Wetland W029 is a palustrine persistent emergent wetland with a seasonally flooded/saturated water regime (PEM1E). The eastern boundary of the wetland is classified as palustrine scrub-shrub with broad-leaved deciduous vegetation and a seasonally flooded/saturated water regime (PSS1E) that begins along the channel of WUS027. During the site visit, the wetland was saturated at 4 inches below the surface and oxidized root channels were observed. Dominant vegetation in the emergent wetland included common rush, jewelweed, shallow sedge, rice cutgrass, arrowleaf tearthumb, *Eupatorium serotinum* (lateflowering thoroughwort), deertongue witchgrass, *Ambrosia trifida* (great ragweed), and *Lespedeza* sp. (bushclover). Eighty-eight percent of the dominant plant species in the emergent wetland met the hydrophytic vegetation criteria. Dominant vegetation in the scrub-shrub wetland consisted of *Sambucus nigra* spp. *canadensis* (common elderberry), *Eupatoriadelphus maculatus* (spotted joepyeweed), reed canarygrass, black willow, and marsh seedbox. One-hundred percent of the dominant vegetation met the hydrophytic vegetation criteria in the scrub-shrub portion of the wetland. Hydric soil criteria were met within 8 inches of the surface with a low-chroma matrix color of 10YR4/2 and redoximorphic features exhibiting colors of 7.5YR4/6.

Waterway WUS030 is classified as an intermittent stream with a riprap substrate (R4SBx). The stream originates on the south side of Veterans Parkway and flows north through a pipe to connect with WUS027. The stream is approximately 4 feet wide and has a depth of 1 foot. During the site visit, no water was present in the channel. Little evidence of bank erosion was observed. Stream habitat complexity is low due to extensive riprap and low flows. The forest buffer is dominated by red maple, tulip poplar, black locust, and willow, providing approximately 30 percent shading to the stream.

Wetland W031 is located within the floodplain of WUS030. This system is classified as a palustrine persistent emergent wetland with a temporarily flooded water regime (PEM1A). At the time of the site investigation, soils were saturated 8 inches below the ground surface. The dominant vegetation within the wetland included broadleaf cattail, marsh seedbox, deertongue witchgrass, shallow sedge, common rush, *Eupatorium perfoliatum* (common boneset), fowl mannagrass, green bulrush, goldenrod, and *Carex vulpinoidea* (fox sedge). One-hundred percent of the plant species met the hydrophytic vegetation criteria. The soil profile was disturbed as the wetland is located at the base of a culvert and receives flow from several ephemeral channels.

Waterway WUS034 is classified as an intermittent stream with a sand and riprap substrate (R4SB4x). This stream parallels the south side of Ellin Road and flows east. The stream connects to WUS036 through a culvert that runs under Hanson Oaks Drive. The stream is approximately 4.5 feet wide and has a depth of 3 feet. During the site visit, approximately 3 inches of water were present in the channel. Bank erosion was moderate as evidenced by

unvegetated banks. Stream habitat complexity was low due to a lack of stable habitat. The forest buffer is dominated by American sycamore, maple, sweetgum, black locust, and catalpa, providing approximately 85 percent shading to the stream.

Wetland W035 is classified as a palustrine persistent emergent wetland with a seasonally flooded water regime (PEM1E). The wetland is a floodplain system that is associated with WUS034. During the site visit, the soil was moist at 2 inches below the surface, but not saturated due to drought conditions. Dominant vegetation includes jewelweed, false nettle, broadleaf cattail, Asiatic tearthumb, spotted joepyeweed, and shallow sedge. One-hundred percent of the plant species met the hydrophytic vegetation criteria. The hydric soil criteria were met within 2 and 8 inches of the ground surface. Soil samples within this zone exhibited a low-chroma matrix color of 10YR3/2 with redoximorphic features exhibiting colors of 7.5YR4/6.

Waterway WUS036 is classified as an intermittent stream with a riprap substrate (R4SBx). The stream originates at a culvert that carries flow from WUS034 under Hanson Oaks Drive and continues east to W037. This stream is approximately 3.5 feet wide and has a depth of 1.5 feet. At the time of the field visit, there was approximately 1 inch of water in the channel. Little evidence of bank erosion was observed. Stream habitat complexity is low due to shallow flows and lack of in-stream habitat. The forest buffer is dominated by American sycamore, black willow, silver maple, and catalpa, providing shading to approximately 95 percent of the stream.

Wetland W037 is a stormwater management wetland that receives runoff from Ellin Road. This wetland is classified as palustrine persistent emergent with a permanently flooded water regime (PEM1H). During the site visit, the wetland was inundated with an unknown depth of water. Dominant vegetation includes *Lythrum salicaria* (purple loosestrife), common reed, broadleaf arrowhead, common rush, and goldenrod. One-hundred percent of the dominant plant species met the hydrophytic vegetation criteria. Soil samples were not taken due to excessive inundation.

Waterway WUS038 is classified as an intermittent stream with a sand and riprap substrate (R4SB4x). The stream parallels the north side of Ellin Road and is bordered by the community of West Lanham Hills to the north. This stream is approximately 4 feet wide and has a depth of 1 foot. At the time of the field investigation, approximately 2 inches of water were present in the channel. Little or no evidence of bank erosion was observed. Stream habitat complexity was low due to a lack of riffle-pool sequences. The forest buffer is dominated by catalpa, *Prunus* sp. (cherry), tulip poplar, poison ivy, and *Vitis* sp. (grape vine), providing approximately 95 percent shading to the stream.

Waterway WUS039 is classified as an intermittent stream with a sand and riprap substrate (R4SB4x). This stream parallels the east side of Veterans Parkway and then enters a culvert that flows under West Lanham Hills Neighborhood Park. The stream continues south after exiting the pipe and parallels the north side of Ellin Road. This stream is approximately 4.5 feet wide and has a depth of 2 feet. During the site visit, approximately 1 inch of water was present in the channel. Bank erosion was moderate due to the stream eroding the unvegetated bank that runs along a wall. The wall was constructed to support the east side of Veterans Parkway. Stream

habitat complexity was low due to low flows and lack of a stable habitat. The forest buffer is dominated by elm, arrowwood, red maple, poison ivy, and Japanese honeysuckle, providing shading to approximately 95 percent of the stream.

North Veterans Parkway Maintenance and Storage Facility Site

Waterway WUS026 is classified as an intermittent stream with a riprap substrate (R4SBx). The stream flows north from a pipe on the north side of Veterans Parkway to join a tributary to Brier Ditch. This stream is hydrologically supported by W026, which flows north under Veterans Parkway.. The stream is approximately 3 feet wide and has a depth of 2 feet. At the time of the site visit, there was no water in the channel. Little evidence of bank erosion was observed. Stream habitat complexity is very low due to extensive riprap and lack of flow. The forest buffer is dominated by black locust, black willow, *Sassafras albidum* (sassafras), *Pontederia cordata* (pickerelweed), and arrowhead, providing approximately 35 percent shading to the stream.

Waterway WUS043 is a tributary to Brier Ditch classified as a perennial stream with gravel and sand substrate (R2UB1/2). The stream is approximately 10 feet wide and 5 feet deep. During the site visit, the average water depth was 3 feet. The in-stream habitat complexity is characterized by deep pools, undercut banks, and a relatively high amount of downed woody debris. The stream is severely eroding as evidenced by vertical, unvegetated banks. The riparian buffer of the stream is forested with dominant species of *Quercus alba* (white oak), *Quercus prinus* (chestnut oak), red maple, and ironwood. The buffer provides 98 percent shading to the stream.

Glenridge Maintenance Facility

Waterway WUS032 is classified as an intermittent stream with a riprap substrate (R4SBx). The stream is west of Veterans Parkway and south of the entrance to the West Lanham Shopping Center. The stream is approximately 3.5 feet wide and has a depth of 1 foot. At the time of the field investigation, no water was present in the channel. Little evidence of bank erosion was observed. Stream habitat complexity is very low due to low flows and lack of habitat. The forest buffer is dominated by box elder, American sycamore, maple, poison ivy, and multiflora rose, providing shading to approximately 90 percent of the stream.

Wetland W033 is classified as a palustrine persistent emergent wetland with a seasonally flooded/saturated water regime (PEM1E). During the site visit, water marks were present and soils were dry due to drought conditions. Vegetation within the wetland included broadleaf cattail, common rush, spotted ladysthumb, Vernonia noveboracensis (New York ironweed), and Schoenoplectus tabernaemontani (softstem bulrush). One-hundred percent of the plant species met the hydrophytic vegetation criteria. Soils within the wetland are composed of fill material and exhibit redoximorphic features.

Wetland W047 is on the west side of Veterans Parkway within Glenridge Community Park. The wetland consists of a wetland pond classified as a palustrine broad-leaved deciduous scrub-shrub with a permanently flooded water regime (PSS1H). The pond discharges into a stream that flows north toward Veterans Parkway. During the site visit, the wetland was inundated with an

unknown depth of water. Soils were saturated to the surface, and water was present at the surface in an unlined bore hole. Dominant vegetation in the wetland included river birch saplings, black willow, broadleaf cattail, false nettle, and broadleaf arrowhead. One-hundred percent of the dominant plant species met the hydrophytic vegetation criteria. Hydric soils were assumed to be present based on the long duration of inundation of the basin.

Waterway WUS048 flows north from W047 toward Veterans Parkway. This stream is classified as intermittent with a sand and riprap substrate (R4SB4x). The average channel width of the stream is 14 feet with a depth of 9 feet. No water was present within the channel during the site visit. The stream is channelized for most of its length, and the entire channel has been reinforced with riprap. Severe erosion is occurring in the stream, as evidenced by failing, unvegetated banks and extensive areas of scour. The riparian buffer of the stream is forested with dominant species of sweet gum, red maple, poison ivy, and Eupatorium fistulosum (joe pye weed). The buffer provides 90 percent shading to the channel.

MTA Property Site

Waterway WUS049 originates from a beaver dam located within W051 and flows south along the east side of a parking lot for the New Carrollton MARC/Amtrak Station. This stream is classified as lower perennial with a sand substrate (R2UB2). The average channel width of the stream is 10 feet with a depth of 4 feet. During the site visit, an average of 2 feet of water was present in the channel. The stream has been channelized along the edge of the parking lot. In-stream habitat complexity is low due to the lack of riffle-pool sequences. Silt deposition is heavy due to road runoff. The riparian buffer consists of black willow, common reed, and arrowleaf tearthumb. The buffer provides approximately 5 percent shading to the stream.

Waterway WUS050 flows from a culvert under Garden City Drive and flows south into WUS049. This stream is classified as lower perennial with a sand substrate (R2UB2). The average channel width is 6 feet with a depth of 3 feet. During the site visit, 2 feet of water was present in the channel. The stream is channelized from WUS049 to the culvert. The riparian buffer is dominated by buttonbush, arrowleaf tearthumb, and multiflora rose. The buffer provides approximately 80 percent shading to the stream.

Wetland W051 is roughly bordered by Garden City Drive to the north, Corporate Drive to the east, Pennsy Drive to the south, and a parking lot for the New Carrollton MARC/Amtrak Station to the west. The entire site has been impacted by prior beaver activity, as evidenced by several dams and flooded areas. The wetland drains into WUS049 at a beaver dam in the northwest corner of the site. This area is classified as a palustrine scrub-shrub wetland with broad-leaved deciduous vegetation and a seasonally flooded/saturated water regime (PSS1E). During the site visit, the wetland was inundated with 0.5 inches of water and soils were saturated to the surface. Other indicators of hydrology included drainage patterns and water-stained leaves. Water was also present at the surface in an unlined bore hole. Dominant vegetation in the wetland included black willow, buttonbush, false nettle, rice cutgrass, broad-leaf arrowhead, Pennsylvania smartweed, swamp smartweed, marshpepper smartweed, common elderberry, *Cyperus strigosus* (straw-color flatsedge), soft-stem bulrush, *Lythrum salicaria* (purple loosestrife), and broadleaf cattail. The hydric soil criteria were met between 3 and 6 inches of the soil profile with a low

chroma matrix color of 2.5Y4/2 and redoximorphic features exhibiting colors of 10YR3/6. The principal functions and values associated with this wetland include groundwater recharge/discharge, floodflow alteration, fish and shellfish habitat, sediment/toxicant retention, nutrient removal, production export, sediment/shoreline stabilization, and wildlife habitat.

Waterway WUS052 flows south along the eastern boundary of W051 and along the west side of Corporate Drive. This stream is classified as lower perennial with a mud substrate (R2UB3). The average channel width is 4.5 feet with a depth of 2 feet. During the site visit, an average of 2 inches of water was present in the channel. The stream receives high amounts of road runoff, which has contributed to the heavy amount of silt deposition within the stream. Stream habitat complexity is very low due to the lack of riffle-pool sequences. The forested buffer is dominated by catalpa, multiflora rose, poison ivy, elderberry, and *Ampelopsis brevipedunculata* (porcelain berry). The buffer provides approximately 100 percent shading to the stream.

Waterway WUS053 is located in the southeast corner of wetland W051 and is bordered to the east by Corporate Drive. This stream is classified as intermittent with a sand substrate (R4SB4). The average channel width is 10 feet with a depth of 4 feet. During the site visit, approximately 2 feet of water were present in the channel. Bank erosion is moderate as evidenced by several undercut banks. Silt deposition is high due to road runoff. The riparian buffer is dominated by muliflora rose, *Cornus amomum* (silky dogwood), black willow, and catalpa. The buffer provides approximately 10 percent shading to the stream.

Waterway WUS054 is classified as an intermittent stream with a sand substrate (R4SB4). The stream originates north of Pennsy Road and flows west into W051. The average channel width is 5 feet with a depth of 2 feet. At the time of the site visit, an average of 4 inches of water was in the channel. In-stream habitat complexity is characterized by deep pools and several riffle/pool sequences. Silt deposition is high, and little evidence of bank erosion was observed. The riparian buffer is dominated by common elderberry, willow, poison ivy, and multiflora rose. The buffer provides shading to approximately 70 percent of the stream.

Wetland W055 is classified as a palustrine scrub-shrub wetland with a seasonally flooded/saturated water regime (PFO1E). This wetland is on the north side of Vetarans Parkway, north of W029. During the site visit, soils were saturated at the surface and drainage patterns were observed in the wetland. Water was also present at 10 inches below the ground in an unlined bore hole. Dominant vegetation in the wetland includes black willow, smooth alder, rice cutgrass, boneset, broadleaf cattail, lady's thumb, late-flowering thoroughwort, and softstem bulrush. The hydric soil criteria were met between 5 and 8 inches of the soil profile with a low chroma matrix color of 5Y3/1 and redoximorphic features exhibiting colors of 10YR5/6.

Waterway WUS056 is classified as a perennial stream with a mud substrate (R2UB3). The stream flows north through W055 to join a tributary to Brier Ditch. The average channel width is 2.5 feet with a depth of 2 feet. During the site visit, 1 inch of water was present in the channel. The stream banks have been reinforced with riprap for most of their length. In-stream habitat is lacking due to low flows and an absence of stable habitat. Bank erosion is moderate as evidenced by undercut banks. The riparian zone of the stream consists of a sewer line crossing

and forested areas. Dominant species within the forested buffer include sweet gum, red maple, and tulip poplar. The buffer provides shading to approximately 70 percent of the stream.

Haig Court Site

Wetland W045 is located west of Haig Drive on the south side of River Road. This area is classified as a palustrine broad-leaved deciduous forested wetland with a seasonally flooded/saturated water regime (PFO1E). A pond west of the wetland outfalls into this location; creating a constant source of hydrology. During the site visit, soils were saturated to the surface. Other indicators of hydrology include drainage patterns and water-stained leaves. Dominant vegetation in the wetland includes red maple, *Saururus cernuus* (lizard's tail), false nettle, fowl mannagrass, and lady's thumb. One hundred percent of the dominant plant species met the hydrophytic vegetation criteria. The hydric soil criteria were met within 2 and 8 inches of the soil profile with a low chroma matrix color of 10YR4/2 and redoximorphic features exhibiting colors of 7.5YR4/6. The principal functions and values associated with this wetland include groundwater recharge/discharge, floodflow alteration, fish and shellfish habitat, sediment/toxicant retention, and sediment/shoreline stabilization.

Lyttonsville Maintenance Facility

No wetlands or waterways were identified within this potential maintenance and storage facility.

2.6.3. Effects

Impacts to waters of the United States, including wetlands, from each of the Build Alternatives are shown in **Tables 2-11** and **2-13**. Impacts to individual numbered wetland and waterway systems for all of the Build Alternatives and the maintenance and storage facility sites are located in Appendix F. There are no tidal wetlands identified along the project alternatives. However, effects to nontidal resources may require a Maryland Nontidal Wetlands Permit, a Section 401 Water Quality Certificate, a Waterway Construction Permit from the MDE, and a Section 404 permit from the USACE for the discharge of dredged or fill material into waters of the United States, including wetlands. The impacts to waters of the United States, including wetlands, were based on a footprint that assumes the greatest potential extent of disturbance because design elements associated with the Build Alternatives are still being refined. Impacts to wetlands and streams will most likely be lower in later phases of the project as the design elements are configured into the Build Alternatives. The footprint also includes multiple design options within the Silver Spring and UM/College Park segments that are not being calculated separately at this point. Once specific design options are selected, the impact numbers within these segments will most likely be reduced as redundant impacts from multiple design options are removed. Most of the wetlands identified along the corridors fall outside the limits of disturbance for the project. Impacts that do occur are primarily related to streams that cross perpendicular to the project or parallel the roadway and would be affected when existing roads are widened to accommodate the transitway. Impacts to streams that are currently bridged would be temporary as these existing structures would be extended to accommodate widening. In streams where new culverts are proposed, the impacts would be expected to be more permanent. The major stream crossings with existing bridges include Rock Creek, Sligo Creek, Northwest Branch, and Northeast Branch.

Table 2-11: Impacts to Wetlands within the BRT and LRT Alternatives (Acres)

Low Invest. BRT	Medium Invest. BRT	Medium Invest. BRT w/ Preinkert Drive	High Invest. BRT	High Invest. BRT w/ Thayer Option	Low Invest. LRT	Medium Invest. LRT	Medium Invest. LRT w/ Preinkert Drive	High Invest. LRT	High Invest. LRT w/ Thayer Option
1.18*	1.30*	1.29*	1.30**	1.30**	1.28**	1.53**	1.52**	1.48**	1.48**

* A 0.20 acre of POW impact was included within the acreage totals
** A 01.7 acre of POW impact was included within the acreage totals

Table 2-12: Impacts to Wetlands within Maintenance and Storage Facility Sites (Acres)

North Veterans Parkway Site	Glenridge Maintenance Facility	MTA New Carrollton Property	Haig Court Site	Lyttonsville Maintenance Facility
0.00	0.03	2.38	0.00	0.00

Medium Investment LRT would impact the largest area of wetlands (1.53 acres) within the corridor, while Low Investment BRT would impact the smallest area of wetlands (1.18 acres). Most of the impacts to wetlands could be due to the widening of the outside lanes of existing roadways in both directions, particularly in the New Carrollton segment. In this segment, the extensive Brier Ditch wetland system parallels Veterans Parkway from Annapolis Road north to Riverdale Road, which is where most of the widening would occur.

Of the five potential maintenance and storage facility sites, the MTA New Carrollton property has the potential to impact (2.38 acres) the most wetlands within the corridor, as a majority of this site is an extensive wetland system associated with Beaverdam Creek, (**Table 2-12**). Minimal impacts (0.03 acres) would be anticipated for the Glenridge Maintenance facility, while no impacts to wetlands are anticipated with the remaining three maintenance and storage facility sites.

Alternative 5 with the Thayer option would impact the greatest length of streams (5,719.30 linear feet) within the corridor, while Alternative 3 would have the least impact to streams (3,892.37 linear feet) as shown in **Table 2-13**. Under all of the Build Alternatives, the Bethesda/Chevy Chase and New Carrollton segments would impact the greatest length of streams. The proposed relocation of the Georgetown Branch Trail would impact smaller streams that parallel the trail. A large portion of the impact in this segment would be due to the proposed bridge crossing of Rock Creek. However, this impact is based on a footprint that was used to determine the greatest extent of impact until detailed design of this area is available. A bridge currently spans this portion of Rock Creek and is part of the Georgetown Branch Trail. The bridge would most

likely be removed and the existing berm leveled off for the new bridge structure. The pier that is currently present within the channel would not be removed to prevent any in-stream disturbance. Therefore, the impact numbers associated with Rock Creek may be reduced significantly if the design scenario described above is chosen. Any impacts to Rock Creek would only be temporary during construction of the new bridge.

Table 2-13: Impacts to Waterways within the LRT and BRT Alternatives (Linear Feet)

Low Invest. BRT	Medium Invest. BRT	Medium Invest. BRT w/ Preinkert Drive	High Invest. BRT	High Invest. BRT w/ Thayer Option	Low Invest. LRT	Medium Invest. LRT	Medium Invest. LRT w/ Preinkert Drive	High Invest. LRT	High Invest. LRT w/ Thayer Option
3,892.37	5,501	5,068	5,717	5,719	4,222	5,628	5,217	5,660	5,662

Impacts to streams within the maintenance and storage facility sites are shown in **Table 2-14**. The MTA New Carrollton property site would impact the greatest length (1,554.17 linear feet) of streams due to the large Beaverdam Creek tributary system located within this site. Impacts within the North Veterans Parkway site would primarily be associated with the Brier Ditch tributary. No impacts to streams are anticipated for the Haig Court and Lyttonsville sites.

Table 2-14: Impacts to Waterways within Maintenance and Storage Facility Sites (Linear Feet)

North Veterans Parkway Site	Glenridge Maintenance Facility	MTA New Carrollton Property	Haig Court Site	Lyttonsville Maintenance Facility
383.85	35.49	1,554.17	0.00	0.00

Short-term construction impacts would be minimized through strict adherence to erosion and sediment control procedures and MDE SWM management regulations. These procedures include the use of Best Management Practices and structural controls such as the minimization of exposed soils through vegetative cover, use of contouring and diversion to reduce water velocities, routing of runoff to retention basins, and installation of control structures such as sediment fences. For Use I surface waters, in-stream work may not be conducted during the period March 1 through June 15, inclusive, during any year, while Use IV has an in-stream restriction during the period March 1 through May 31. Long-term impacts to water quality will be minimized to the extent possible through the use of an MDE approved SWM plans. SWM

plans will be in compliance with MDE requirements and will be designed to treat both quantity and quality of stormwater runoff prior to discharge into receiving waters.

Effects to streams or vegetated wetlands from any of the Build Alternatives may require a Maryland Nontidal Wetlands Permit, a Section 401 Water Quality Certificate, and a Waterway Construction Permit from the MDE, and a Section 404 permit from the ACOE for the discharge of dredged or fill material into waters of the United States, including wetlands. Coordination with the ACOE and MDE will be required in later phases of the project to make a final determination of the need for permits and to determine mitigation requirements for the selected alternative.

2.6.4. Mitigation

Section 404 of the CWA provides regulatory authority to the Corps to issue or deny permits for discharge of dredged or fill material into waters of the United States, including special aquatic sites (i.e., wetlands, mud flats, riffle pool complexes, and vegetated shallows). Under the requirements of Section 404 and the Maryland Nontidal Wetland Protection Act, a Joint federal/state permit is required for impacts to nontidal wetlands resulting from this project. In accordance with federal and state regulations, efforts to avoid and minimize impacts to wetlands and other waters of the United States are on-going. Avoidance and mitigation will continue through later phases of the project when a corridor has been selected and when more detailed design refinements can be employed to further minimize impacts.

Compensatory mitigation is preferred, when practicable, in areas within or adjacent to the project alternatives (i.e., on-site compensatory mitigation). If on-site compensatory mitigation is not practicable, off-site mitigation should be undertaken in the same watershed as the affected resource, if possible. The agencies may require in-kind, out-of-kind, or a combination of both for mitigation to achieve functional replacement. In-kind replacement is preferred when it is feasible and the impacted resource is locally important, while out-of-kind mitigation is appropriate when it is more practicable and provides an equal or greater watershed benefit than in-kind compensation (e.g., of greater ecological importance to the region of impact). The decision to replace function, acreage, or both may be adjusted at the discretion of the Corps, depending on the practicability of the proposed mitigation.

2.6.5. Wetland Mitigation

Methodology

Appropriate and practicable compensatory mitigation is required for unavoidable impacts to wetlands and other waters of the United States Compensatory mitigation is being evaluated in accordance with state and federal regulations and guidance. Compensatory mitigation focuses on the replacement of the functions provided by an aquatic resource or wetland, in addition to the acreage affected. Traditionally, mitigation requirements under Section 404 were determined by the ratio of wetland acres replaced to wetland acres lost. Emergent wetlands are typically mitigated on a 1:1 replacement basis, while forested and scrub-shrub wetlands are mitigated on a 2:1 basis. The decision to replace function, acreage or both may be adjusted at the discretion of the Corps or MDE, depending on the practicability of the proposed mitigation.

The compensatory mitigation package will be designed to fulfill the mitigation requirements and meet the resource protection goals of natural resource agencies. The wetland mitigation site-selection process focuses on locating non-forested areas with the highest potential for wetland creation or restoration with emphasis on in-kind replacement within the USGS-designated watersheds impacted by the project corridors. These designations are represented by Hydrologic Unit Codes and correspond with the following watersheds crossed by the alternatives: Patuxent (02060006), Middle Potomac-Anacostia-Occoquan (02070010), and the Middle Potomac-Catoctin (02070008).

DNR's prioritization of watersheds was used as a guide to determine which wetland sites ranked higher based on their location within those watersheds designated as high priority and in need of restoration. The following streams within the corridor were designated as priority watersheds: Sligo Creek, Northwest Branch, Paint Branch, Northeast Branch, and Beaverdam Creek.

The site-screening process involves reviewing wetland mitigation site searches in the same watersheds for potential suitable sites and any other sites identified through review of DNR National Agricultural Imagery Program 2005 digital orthophotos. The following criteria were used during the site-screening process for wetlands: soils, hydrology, vegetation, habitat and water quality, and potential constraints.

The soils criteria placed an emphasis on those sites that are mapped as hydric soils, with higher scores related to percent cover of the hydric unit on site. Hydric soil mapping units were identified using the NRCS hydric soils list for those counties involved in the mitigation site search. An ArcView Geographic Information Systems (GIS) soils layer will be used to determine the extent of the hydric soil within the potential wetland establishment site.

The hydrology criteria included a review of on-site agricultural ditches and/or tile drains, surface water input, and drainage area. All three of these parameters were assessed using ArcView GIS applications at the desktop level. The drainage area and surface water input were evaluated using USGS quadrangle overlay in ArcView GIS. The presence of ditches or tile drains on site was established through review of digital orthophoto quarter quads for the potential wetland establishment site. Sites that have artificial drainage and a high drainage area to site size ratio received higher scores for this category.

The vegetation criteria place an emphasis on farmed wetlands, farmed wetland pastures, and fallow land, as designated by the NRCS. These types of sites were initially assessed using infrared aerial photos, which helped to identify wet signatures and active farmland. The conversion of these areas from active agriculture to their original wetland state would support wetland restoration. Frequently, restoration of these areas proves to be more feasible and sustainable than creation of wetlands. In restored sites, the proper substrate may be present, seed sources may be on-site or nearby, and the appropriate hydrological conditions may exist or may be more easily recovered. The Mitigation Memorandum of Agreement between the Corps and EPA states that, "because the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, restoration should be the first option considered" (Fed. Regist. 60(Nov.28) :58605).

Both habitat and water quality criteria were established through review of digital orthophoto quarter quads to determine if the site is contiguous to a riparian corridor or a forest greater than 100 acres. Those sites that were connected to habitat corridors were scored higher for this category. The types of drainage to the site, which include drainage from urban land, agricultural land, and parkland, were also assessed using infrared aerial photography. Those sites that receive drainage from agricultural land and urban land received higher scores for this category.

Both utility and access limitations, as defined under the constraints category, were determined through review of digital orthophoto quarter quads and a GIS utility overlay. The fewer utilities associated with a site and the presence of an access road from the potential wetland establishment site to a public road result in higher scores for a site.

The condition of each site was verified in the field and recorded on the Wetland Mitigation Site Evaluation Worksheet (Appendix G). Field verification of the site based on the criteria described above was necessary to update changes in land use or hydrology since the issue date of the digital orthophotos. A summary roster of all sites was developed listing the site location, ADC map coordinate, subwatershed, and potential acreage of created wetlands. Using the roster of sites and site maps, each candidate site was reviewed from public roadways to confirm land cover.

Each site was reviewed for the above-referenced criteria, which are scored with a factor of 10, 5, or 1, for a total of 100 points. The 10 factors represent the highest or best possible score. The higher the score, the more suitable the site is for wetland creation. After the sites were ranked, based on the mitigation ranking total or total number of points from the Wetland Mitigation Site Evaluation Worksheet, the top 20 percent were retained for further study and agency review.

Wetland Mitigation Results

Eight potential mitigation sites were retained for further study, as shown in **Table 2-15**. Those sites that are smaller than the required acreage for mitigation could be used in conjunction with another site to fulfill the mitigation ratios. In later phases of the project, detailed studies and on-site investigations will need to be conducted to determine which sites move forward in the mitigation process.

2.6.6. Stream Mitigation

Methodology

The Corps typically requires mitigation for waterway impacts on a project-specific basis. The agencies target compensatory stream mitigation projects to replace stream functions when feasible. In addition to stream channel improvements, mitigation measures for waterway impacts consider the size, stream order, and location of the stream to determine appropriate stream mitigation. Other mitigation measures, such as removal of fish blockages, riparian buffer enhancements, and water quality improvements, may be used at the agencies' discretion.

Table 2-15: Summary Table of Potential Wetland Mitigation Sites

Site ID	Watershed	County	ADC Map Coordinate	Location Description	Acres	Score	Existing Conditions
RC-3	Rock Creek	Montgomery	36 D7	Within Rock Creek Park, east of Kensington Parkway and south of Beach Drive	0.6	62	This site is bound by a tributary of Rock Creek on the west, forest on the south, and a scrub-shrub wetland on the east. The site is partially maintained by mowing. A sewer line crosses the west side of the site. Hydric soils are present, and it appears that this site could be hydrologically connected to the scrub-shrub wetland on the east by grading. The stream channel is incised and will not assist with hydrology.
RC-5	Rock Creek	Montgomery	35 J5	East of Fleming Avenue, northeast of Fleming Park. Access from the Renewable Natural Resources Foundation property	1.6	53	It is difficult to see the layout of this site due to overgrown vines. Hydric soils are present, and the site joins to a headwater tributary of Rock Creek to the south. The site appears high in the watershed and has a small drainage area, so finding a source of hydrology may be difficult.
RC-6	Rock Creek	Rock Creek	36 C2	Southeast of Decatur Avenue and west of MD 185, within park	5.2	62	This site is located within a park that appears to be very well used. The site has hydric soils and is adjacent to forested and scrub-shrub wetlands. There is little or no elevation difference between the site and the wetlands, so little grading would be necessary.
RC-7 & RC-8	Rock Creek	Montgomery	30 B12	South of Randolph Road and west of Dewey Road	0.8	62	These sites are adjacent to Rock Creek. They contain hydric soils but are situated 8 to 10 feet above the stream. A lot of grading would be required to create a source of hydrology for these sites.
				North of Randolph Road and west of Dewey Road	1.8		

Table 2-15: Summary Table of Potential Wetland Mitigation Sites

Site ID	Watershed	County	ADC Map Coordinate	Location Description	Acres	Score	Existing Conditions
RC-9	Rock Creek	Montgomery	29 K9	West of Viers Mill Road and southwest of Aspen Hill Road, within Parklawn Soccer Fields	4.3	76	This site contains hydric soils and is adjacent to a large forested wetland. There is little elevation difference between the site and the forested wetland, so little grading would be necessary. A paved trail parallels the treeline along the southwest side of the site. This would need to be removed or displaced elsewhere.
RC-1	Rock Creek	Montgomery	36 B8	East of Taylor Road and south of I-495, within the National Naval Medical Center property	2.8	71	This site was not reviewed during the windshield surveys due to access issues. However, the site contains hydric soils and is within the floodplain of a tributary to Rock Creek. The source of hydrology is questionable until the site is reviewed.
RC-2	Rock Creek	Montgomery	36 A8	Between Rockville Pike and Wood Road, within the National Naval Medical Center property	1.2	67	This site was not reviewed during the windshield surveys due to access issues. However, it appears to be topographically low and contains hydric soils. The site surrounds an existing pond; however the hydrologic source is unknown.
RC-10	Rock Creek	Montgomery	29 J9	West of Viers Mill Road, east of Crookston Lane	2.3	58	This site is adjacent to a stream but it is elevated approximately 8 feet above the stream channel. The site contains hydric soils; however, excessive grading would be necessary to create hydrology other than surface runoff from the apartment complex to the west.

As discussed in the wetland mitigation section, the DNR's prioritization of watersheds was used to determine high priorities for restoration. Mitigation sites within these watersheds would focus on improving water quality and in-stream habitat, decreasing stream erosion, and restoring gaps within the green infrastructure, as identified in DNR's prioritization document (DNR 2007).

The site-screening process involves reviewing stream mitigation site searches in the same watersheds for potential suitable sites and any other sites identified through review of DNR National Agricultural Imagery Program 2005 digital orthophotos. The following criteria were used during the site-screening process: riparian condition, watershed position, fish blockage, stream morphology, green infrastructure, habitat/water quality, and access.

The riparian condition criteria were assessed using infrared aerial photography to determine the absence of vegetation within the flood-prone area of the stream. Floodplain areas within urban land and active agricultural areas scored highest, as these areas are in need of a vegetated riparian buffer that would provide shade and in-stream habitat.

The watershed position criteria are established through review of GIS stream information provided by both Montgomery and Prince George's Counties. Streams within the headwaters of a watershed scored higher than those in lower reaches because nutrients, sediments, and other constituents are treated in the headwaters before entering the lower portions of the stream.

Streams that have a fish blockage are noted in the field. Removal of a fish blockage would improve fish passage and improve in-stream habitat as the stream gradient readjusts and flow patterns become more stable.

The stream morphology criteria are assessed in the field to determine if the stream is concrete-lined, channelized with a natural substrate, or in a natural condition and pattern. Streams that have a concrete-lined substrate score higher, as the removal of this material would reestablish in-stream habitat where there was none.

The green infrastructure criteria were assessed and established using DNR's green infrastructure gaps, hubs, and corridors maps. The green infrastructure is comprised of important natural resource areas that have been identified by DNR based on principles of landscape ecology and conservation biology. Hubs are typically large, contiguous acres (approximately 2,200 acres) that contain large blocks of forests, wetlands, and important animal and plant habitats; rare, threatened, and endangered species; pristine streams; and existing protected natural resource lands that contain the items listed. Green Infrastructure Corridors generally follow the best ecological or natural routes between hubs. Gaps in the green infrastructure are categorized as developed, agricultural, or mined lands that could be targeted for restoration. Streams within these gaps score higher than those within hubs and corridors.

The habitat and water quality criteria assessed in-stream habitat for both fish and macro-invertebrates through a qualitative assessment of clean riffles, rootwads, shade, downed woody debris, embeddedness, bank erosion, and stream morphology.

The access criteria were assessed in the field to determine whether an access road connects the potential stream restoration site to a public road. This situation would provide higher scores for a site.

The condition of each site was verified in the field and recorded on the Stream Mitigation Site Evaluation Worksheet (Appendix H). A summary roster of all sites was developed listing the site location, ADC map coordinate, subwatershed, and potential acreage of created wetlands. Using the roster of sites and site maps, each candidate site was reviewed in the field from public roadways to confirm land cover.

Each site was reviewed for the above-referenced criteria, which are scored with a factor of 10, 5, or 1, for a total of 100 points. The 10 factors represent the highest or best possible score. The higher the score, the more suitable the site is for stream restoration. After the sites have been ranked, based on the mitigation ranking total or total number of points from the Stream Mitigation Site Evaluation Worksheet, the top 20 percent will be retained for further study and agency review.

Stream Mitigation Results

Twelve potential stream restoration sites were retained for further review and detailed studies as shown in **Table 2-16**.

2.7. Terrestrial Habitat and Wildlife

2.7.1. Terrestrial Habitat

The 18-mile corridor is located primarily within urban and suburban areas of Montgomery and Prince George's Counties between Bethesda and New Carrollton, Maryland. As such, very few areas within the study corridor support natural habitats. The portions of the corridor supporting larger tracts of natural forested habitat occur primarily within the larger stream valleys, including Rock Creek, Sligo Creek, Northwest Branch, Paint Branch, Northeast Branch, and an unnamed tributary to Brier Ditch. The remainder of the corridor contains smaller patches of mostly disturbed vegetation that occurs on the Columbia Country Club; along smaller tributary streams; within small community parks (e.g., Adelphi Park); on the campus of the UM at College Park; as buffers adjacent to residential, commercial, institutional, and industrial development; and within transportation and utility rights-of-way.

Methods

Land cover within the corridor was assessed through field reconnaissance and the use of aerial mapping. The Anderson et al. (1976) land use and land cover classification was used to classify the corridor into broad categories of land use. Vegetative communities and associations were characterized through field reconnaissance, aerial mapping, and the *Vegetation Map of Maryland* (Brush et al. 1976).

Table 2-16: Summary Table of Potential Stream Mitigation Sites

Site ID	Watershed	County	ADC Map Coordinate	Location Description	Linear Feet	Score	Existing Conditions
AR-14	Anacostia River	Prince George's	11 E1/F1	From New Hampshire Avenue south to Ray Road	1,500	57	This stream is a tributary of Sligo Creek and is concrete-lined from New Hampshire Avenue to where it crosses Ray Road. There is good construction access from the right bank, which consists of mowed grass and scattered trees and shrubs. There is a steep slope followed by a power substation on the left bank, which could present a problem. The headwall at Ray Road was under construction during the field review, but there was severe erosion on the left bank immediately downstream of the culvert.
PR-1	Potomac River	Montgomery	35 J12/13	Crosses Bradley Boulevard west of Little Falls Parkway	2,000	52	This stream is a headwater tributary of Little Falls. The stream is very channelized and is severely eroded. Due to the forested buffer, construction access may be difficult.
PR-2	Potomac River	Montgomery	40 K1	Crosses Dorset Avenue west of Little Falls Parkway	350	49	This stream is a tributary of Little Falls and is concrete-lined. The left bank consists of large trees and an apartment complex. The right bank is a mix of mowed grass, trees, and shrubs. Construction access would have to take place from the right bank.
PR-3	Potomac River	Montgomery	40 J3	Just south of Massachusetts Avenue at the intersection of Little Falls Parkway	100	51	This site is the mainstem of Little Falls where it crosses Massachusetts Avenue. Just south of the culvert, there is a fish blockage caused by a 3-foot drop from a sewer line crossing. There is also severe erosion on the left bank as the stream flows out of the culvert. The smell of sewage was present during the field review.
PR-4	Potomac River	Montgomery	40 K3	South of Willard Avenue, paralleling Little Falls Road	400	52	This stream is a tributary of Little Falls and is a concrete-lined trapezoidal channel. Access to the site is very good, especially from the right bank, which consists of mowed grass with scattered trees and is paralleled by roadway.
PR-5	Potomac River	Montgomery	40 J2	North of River Road, east of Brookside Drive	900	49	This stream is a tributary of Little Falls and is downstream of site PR-2. This concrete-lined channel has a narrow scrub-shrub buffer with scattered large trees. Construction access may be difficult since apartments are on the left bank and a shopping center is on the right bank.

Table 2-16: Summary Table of Potential Stream Mitigation Sites

Site ID	Watershed	County	ADC Map Coordinate	Location Description	Linear Feet	Score	Existing Conditions
AR-9	Anacostia River	Prince George's	13 F11	Barlowe Road to Redskins Road	2,500	51	This tributary of Beaverdam Creek has severe erosion on the upstream and downstream sides of Barlowe Road. Water in the channel was cloudy and gray. Construction access may be difficult due to the forested buffer.
AR-2	Anacostia River	Prince George's	13 E10	South side of MD 202, west of Bartlowe Road	100	55	This tributary of Bearverdam Creek has a fish blockage just downstream of Landover Road. The concrete-apron from a twin-box culvert causes a 3-foot drop to the water surface. Banks near the culvert appear unstable. A concrete pipe adjacent to the culvert is being undermined, exposing a portion of the pipe.
AR-1	Anacostia River	Prince George's	13 A8/9	South of MD 202, east of US 50	100	47	Beaverdam Creek has a fish blockage just downstream of Landover Road. The concrete apron from a triple-box culvert has created a 2-foot drop to the water surface. A tributary flows into the mainstem of Beaverdam Creek from a twin corrugated arch culvert that has created a 0.5-foot drop to the water surface.
AR-5	Anacostia River	Prince George's	13 C6	North of Pennsy Drive, east of Veterans Parkway	1,000	53	This reach of Beaverdam Creek is channelized and moderately to severely eroded. Water in the channel is cloudy and gray and trash is abundant. The stream is bound by steep slopes on both sides with business lots to the south and a roadway to the north. Construction access for restoration may be difficult.
AR-21	Anacostia River	Prince George's	12 B5	South of MD 202, within Magruder Park	1,700	52	This stream is a tributary of Northwest Branch and is channelized and moderately eroded. A sewer line crosses the stream, creating a 2-foot drop that blocks fish movement upstream.
AR-12	Anacostia River	Montgomery	37 E9	Crosses Piney Branch Road, east of Garland Avenue	200	48	This portion of Long Branch is severely eroded. Gabions were previously placed along the right bank, but severe erosion occurs prior to its placement. Large amounts of trash are present in the channel and in the forested/scrub-shrub buffer. Water in the channel was very dark, and the smell of sewage was noticed during the field review.

Existing Conditions

The entire corridor is broadly classified as Urban or Built-up Land (Anderson et al. 1976). This Level I classification includes sub-classes (Level II) of residential; commercial and services; industrial; transportation, communications, and utilities; and other urban or built land. This land use also includes the forested stream valleys that bisect this area and smaller patches of green space surrounded by the built environment.

Larger areas of non-forested habitat are associated primarily with the Columbia Country Club, Adelphi Park, the UM College Park campus, undeveloped parcels along River Road, Glenridge Community Park, and undeveloped parcels along Ellin and Harkins Roads at the eastern terminus of the Purple Line. These latter three sites are comprised of disturbance-tolerant tree, sapling, shrub, vine, and herbaceous species, including numerous non-native, invasive varieties such as *Pyrus calleryana* (Bradford pear), *Ailanthus altissima* (tree-of-heaven), *Ulmus pumila* (Siberian elm), *Rosa multiflora* (multiflora rose), species of *Lonicera* (both bush and vine honeysuckles), *Celastrus orbiculatus* (Oriental bittersweet), and *Polygonum perfoliatum* (Asiatic tearthumb). Portions of the Columbia Country Club and the UM College Park campus are comprised primarily of lawn grasses with scattered larger trees. Adelphi Park is comprised of lawn grasses surrounded by forested vegetation. Throughout the remainder of the project corridor, isolated street trees and small patches of lawn grasses comprise non-forested areas.

Forest Characterizations

Forested habitat within the project corridor occurs primarily within the larger stream valleys, as illustrated in **Figure 2-6**. According to the *Vegetation Map of Maryland* (Brush et al. 1976), areas within the riparian corridor of these stream valleys are classified within the River Birch-Sycamore Association. This association is dominated by *Betula nigra* (river birch) and *Platanus occidentalis* (American sycamore). Other common species within this association include *Acer rubrum* (red maple), *Fraxinus pennsylvanica* (green ash), *Liriodendron tulipifera* (tulip poplar), *Liquidambar styraciflua* (sweet gum), *Quercus alba* (white oak), *Prunus serotina* (black cherry), *Cornus florida* (flowering dogwood), *Nyssa sylvatica* (black gum), *Sassafras albidum* (sassafras), *Viburnum dentatum* (southern arrowwood), *Lindera benzoin* (spicebush), *Parthenocissus quinquefolia* (Virginia creeper), *Vitis* spp. (grape), *Lonicera japonica* (Japanese honeysuckle), *Toxicodendron radicans* (poison ivy), *Rubus* spp. (blackberry/raspberry), and *Smilax rotundifolia* (common greenbrier). Based on field reconnaissance, the stream valley corridors more closely matched the Sycamore-Green Ash-Box Elder-Silver Maple Association. This association is dominated by American sycamore, green ash, *Acer negundo* (box elder), and *Acer saccharinum* (silver maple). Other common woody and vine species occurring within this association are similar to those species documented for the River Birch-Sycamore Association.

The majority of the land area outside the stream valleys is mapped within the Tulip Poplar Association. This association is dominated by tulip poplar, but includes other canopy species such as white oak, *Quercus velutina* (black oak), *Quercus rubra* (northern red oak), *Carya tomentosa* (mockernut hickory), *Carya glabra* (pignut hickory), and *Fagus grandifolia* (American beech). Other subcanopy trees and understory vegetation common within this association are similar to those described for the River Birch-Sycamore Association. At the eastern end of the corridor, upland areas are mapped within the Chestnut Oak-Post Oak-

Blackjack Oak Association. This association is comprised of canopy species such as *Quercus prinus* (chestnut oak), *Quercus stellata* (post oak), *Quercus marilandica* (blackjack oak), *Pinus virginiana* (Virginia pine), and other oak and hickory species referenced for the other associations. Other commonly occurring species within this association include *Kalmia latifolia* (mountain laurel), *Gaylussacia dumosa* (dwarf huckleberry), and species listed previously for the other associations.

Bethesda/Chevy Chase

Within the alignment segment between Bethesda/Chevy Chase and Silver Spring, the alternatives extend through mostly residential and institutional developed areas. However, the alignment also includes forested habitat within the North Chevy Chase Recreational Center property north of Jones Bridge Road and east of the National Naval Medical Center. This urban forest community is characterized by mostly larger trees with a diameter at breast height (dbh) of more than 24 inches. These canopy tree species include white oak, tulip poplar, black oak, and red maple. The disturbed understory includes a mix of native and non-native invasive plants, including box elder, honeysuckle, spicebush, poison ivy, multiflora rose, *Hedera helix* (English ivy), and *Glechoma hederacea* (ground ivy). Alternative 4 would traverse the Georgetown Branch Trail. This hiker-biker trail is characterized by a narrow (10- to 30-foot-wide) vegetative strip separating the alignment from backyards, buildings, and commercial areas. This urban edge community is dominated by small trees from 8 to 12 inches dbh. Species typically include a variety of oaks, *Robinia pseudo-acacia* (black locust), box elder, black gum, black cherry, sassafras, *Morus alba* (white mulberry), *Pinus strobus* (white pine), Virginia pine, English ivy, honeysuckle, and multiflora rose. The most extensive areas of open herbaceous growth are west of Connecticut Avenue and in the industrial area next to Stewart Avenue.

East of Connecticut Avenue, the alignment crosses the Rock Creek stream valley. This extensive forest community has been preserved from development through its designation as parkland. The riparian habitat is comprised of species such as American sycamore, red maple, *Salix nigra* (black willow), *Populus deltoids* (eastern cottonwood), green ash, silver maple, tulip poplar, *Carpinus caroliniana* (ironwood), and black gum. The vegetation varies from shrubs to small saplings, trees, and large trees of greater than 24 inches dbh.

Silver Spring

The majority of vegetation in the Silver Spring to University Boulevard segment of the Purple Line is confined to narrow, linear sections of urban edge and street trees. The existing vegetative community is part of the Tulip Poplar Association, and most small forest patches are dominated by tulip poplar and various species of oaks. Many street trees have diameters greater than 30 inches. Two separate options within this segment would cross the Sligo Creek stream valley. The Wayne Avenue option crosses a narrow forested strip along Sligo Creek. Common trees include black cherry, tulip poplar, American sycamore, silver maple, Q*uercus bicolor* (swamp white oak) and box elder. The Piney Branch Road option crosses a slightly larger riparian forest along Sligo Creek and includes some upland forest patches between Sligo Creek Parkway and Dale Drive. The riparian forest is comprised of species similar to those crossed by the Wayne Avenue option. The upland forest patches include white oak, tulip poplar, black locust, and sassafras in the 12 to 24 inch dbh size class.

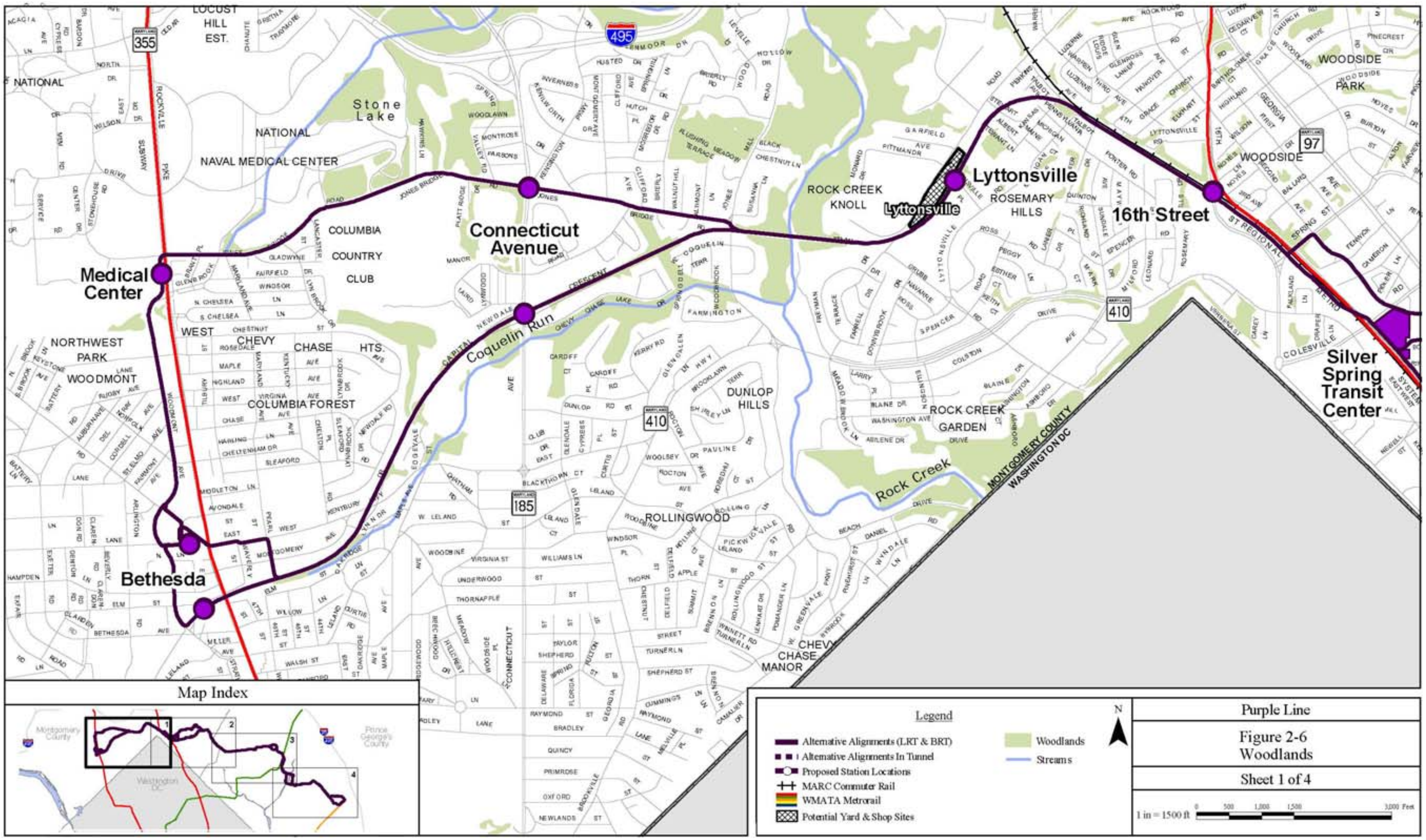

Figure 2-6: Purple Line Woodlands

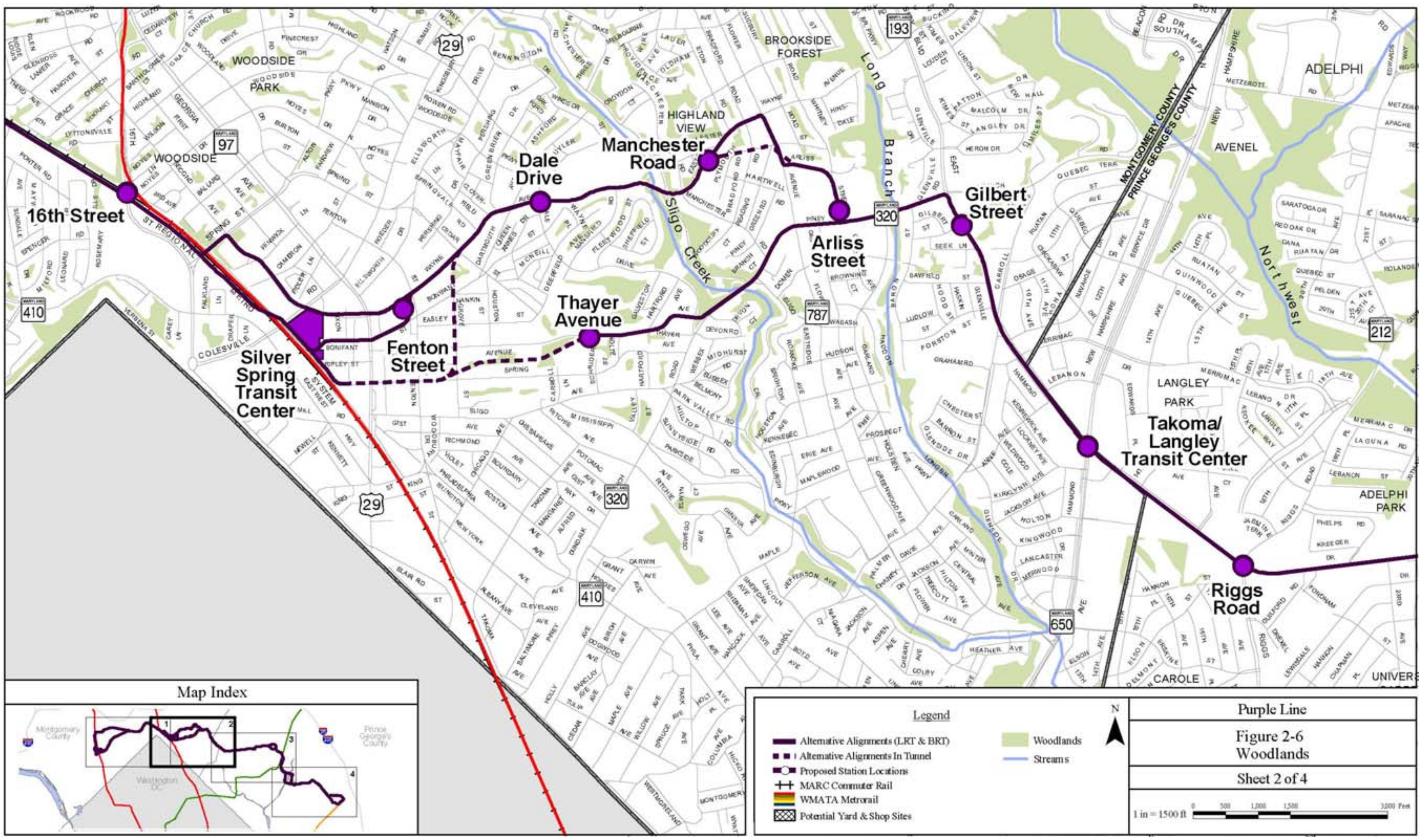

Figure 2-6: Purple Line Woodlands (continued)

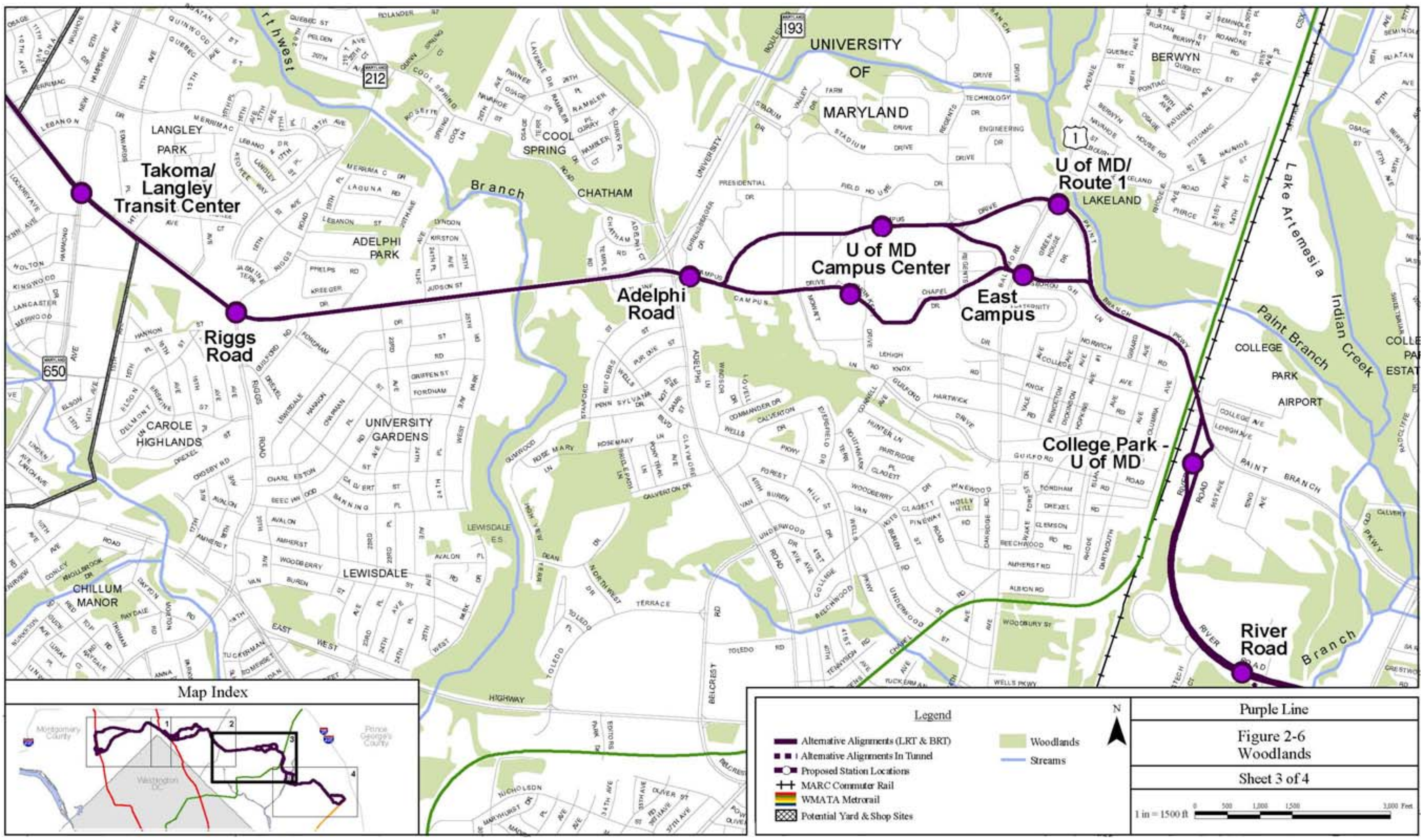

Figure 2-6: Purple Line Woodlands (continued)

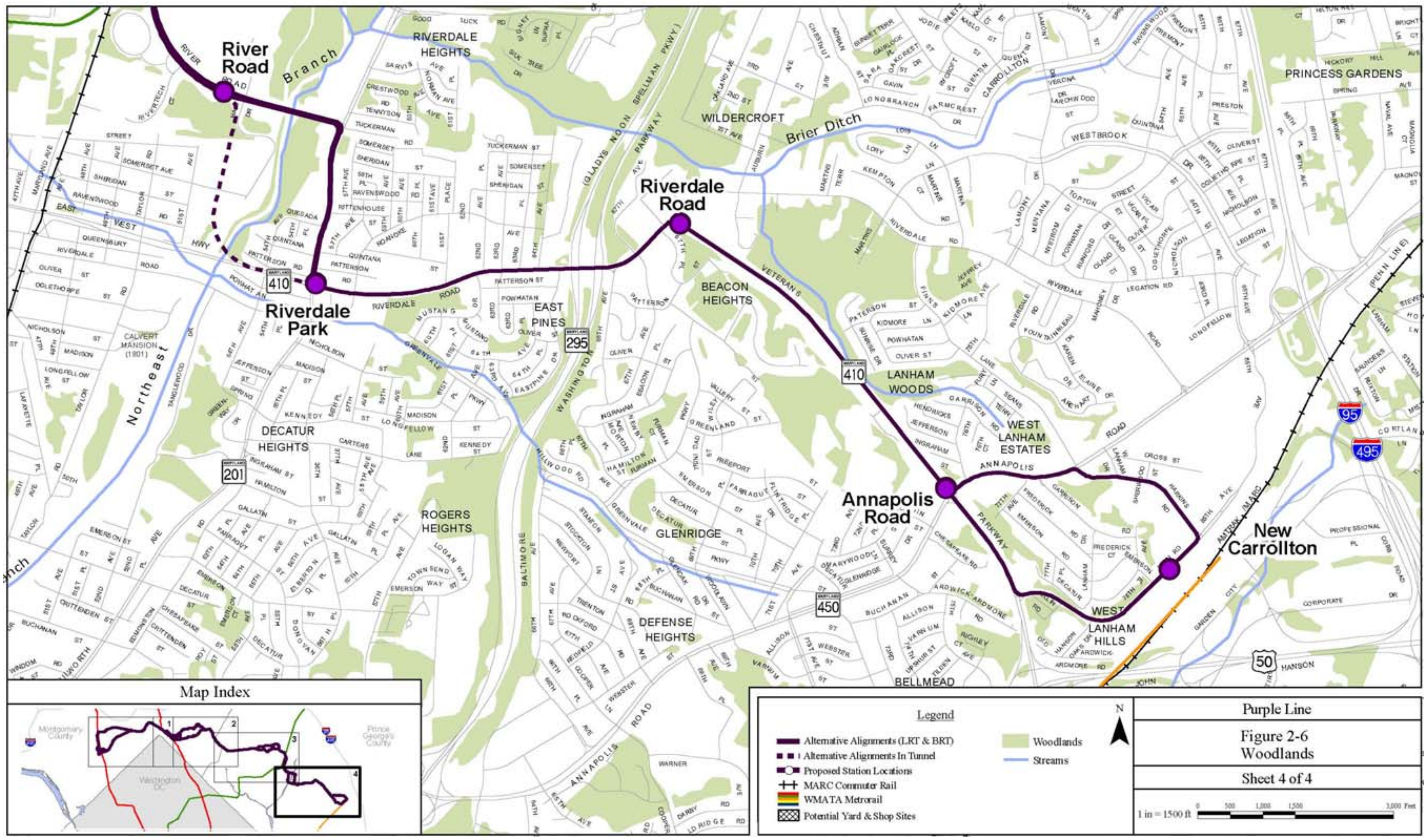

Figure 2-6: Purple Line Woodlands (continued)

University Boulevard

This segment is also dominated by small urban forest patches along low order stream reaches, narrow strips of forest (less than 30 feet wide) that border utility easements, and street trees within residential lots. These small patches of forest are dominated by tulip poplar, black locust, red maple, and oaks in the canopy, and contain many invasive shrub, vine, and herbaceous species in the understory. The segment also crosses Northwest Branch Stream Valley Park and the edges of the adjacent Adelphi Park, Lane Manor Park, and University Hills Park. The riparian zone is relatively narrow where University Boulevard crosses Northwest Branch and is comprised of American sycamore, green ash, and sweet gum. A larger upland forest stand occurs to the east of the stream both north and south of University Boulevard. This stand is comprised primarily of tulip poplar and oaks in the canopy. North of University Boulevard, the forest forms a contiguous stand more than 50 acres in size.

UM/College Park

This segment extends through the UM College Park campus. This area contains numerous large street trees, especially along the Preinkert Drive option, but contains no forested habitat. However, east of US 1, one of the alignment options follows Campus Drive. Campus Drive follows the edge of Paint Branch Stream Valley Park. This riparian forest forms a contiguous stand greater than 50 acres in size. The stand is comprised of canopy species, including American sycamore, green ash, silver maple, and sweet gum. Immediately adjacent to the road the forest is more disturbed and contains disturbance-tolerant native and non-native species, including black locust and tree-of-heaven.

Riverdale Park

This segment includes larger upland forest patches along River Road, west of Northeast Branch, and along the south side of Riverdale Road just east of Kenilworth Avenue and small forest strips and street trees elsewhere within the residential and commercial portion of the segment. One small forest strip occurs on the north side of Riverdale Road immediately east of Baltimore Washington Parkway. This stand contains *Quercus phellos* (willow oak), sweet gum, silver maple, eastern cottonwood, *Ulmus rubra* (slippery elm), and black locust.

The larger forest stands west of Baltimore Washington Parkway are mapped within the Tulip Poplar Association, while upland forest stands east of Baltimore Washington Parkway are mapped within the Chestnut Oak-Post Oak-Blackjack Oak Association. Dominant canopy species observed within the larger forest stands along the River Road alignment option and the portion of the tunnel option that crosses Anacostia River Park include red maple, sweet gum, Virginia pine, tulip poplar, black oak, and white oak. A regrowth stand of Siberian elm occurs along the south side of River Road just west of Haig Drive. The large upland forest stand along the south side of Riverdale Road contains canopy species such as chestnut oak, white oak, black oak, tulip poplar, sweet gum, and black locust.

The River Road and tunnel options also cross the stream valley of Northeast Branch. The riparian forest habitat is sparse where the two options cross Northeast Branch. Dominant canopy

species include red maple and American sycamore. More densely vegetated portions of the riparian corridor include tulip poplar, sweet gum, and red maple in the canopy and black cherry, northern spicebush, honeysuckle, poison ivy, and Virginia creeper in the understory.

New Carrollton

This segment extends along Veterans Parkway and includes options along Ellins and Harkins Roads at the extreme eastern end of the corridor. Larger forested patches occur along Veterans Parkway between Riverdale Road and Annapolis Road. Upland forested areas along the south side of Veterans Parkway east of Riverdale Road are younger stands (2- to 6-inch dbh) dominated by non-native, invasive species such as tree-of-heaven and Bradford pear. Other observed canopy species within these stands include black locust, sweet gum, tulip poplar, and red maple. On the north side of Veterans Parkway, younger stands occur between an apartment complex and the road. These stands contain similar species as described for the younger stands south of Veterans Parkway, but also include Virginia pine. East of the apartment complex, the size of the forest stand and of the dominant canopy trees within the stand increases. This stand lies between the highway and residential areas to the north, and occurs within the floodplain and adjacent steep upland slopes of an unnamed tributary to Brier Ditch. The dominant tree species are within the 6- to 12-inch dbh size class. Within the floodplain, dominant trees include sweet gum, willow oak, sycamore, and silver maple. Dominant canopy trees on upland slopes include sweet gum, chestnut oak, *Quercus falcata* (southern red oak), and tulip poplar.

Smaller strips and patches of forest with larger diameter canopy trees occur along the area bounded by Veterans Parkway, Annapolis Road, Harkin Road, and Ellin Road. These forested areas are dominated by tulip poplar, white oak, willow oak, chestnut oak, southern red oak, sweet gum, and black oak in the 12- to 24-inch dbh size class. These patches typically occur on steep slopes that could not be developed. Elsewhere within this portion of the study corridor, smaller, disturbed forest strips occur as buffers between roads and residential developments. These strips contain Bradford pear, *Catalpa speciosa* (northern catalpa), eastern cottonwood, sweet gum, tulip poplar, and black locust. Some planted rows of white pine and *Cupressocyparis leylandii* (Leyland cypress) also occur within these buffers.

North Veterans Parkway Site

This site occurs primarily on a steep-sloped upland north of Veterans Parkway in the New Carrollton segment. It also includes a portion of the floodplain of the unnamed tributary to Brier Ditch. The densely forested hillside is comprised of canopy species, including white oak in the 18-inch dbh size class and chestnut oak and tulip poplar in the 12- to 16-inch dbh size class. Common understory species include sassafras, flowering dogwood, common greenbrier, mountain laurel, and *Thelypteris noveboracensis* (New York fern). The floodplain portion contains canopy species such as sweet gum and tulip poplar in the 6 to 12-inch dbh size class. Common understory species include arrowwood, common greenbrier, *Clethra alnifolia* (sweet pepperbush), New York fern, *Boehmeria cylindrical* (false nettle), and *Dichanthelium clandestinum* (deertongue witchgrass).

Glenridge Maintenance Facility

This site occurs on upland slopes south of Veterans Parkway within the New Carrollton segment. It is comprised of a mix of native and non-native deciduous trees and Virginia pine evergreen trees, primarily in the 2- to 6-inch dbh size class. Common deciduous trees include tree-of-heaven, Bradford pear, black locust, tulip poplar, red maple, and sweet gum. Little understory is present within this dense regrowth stand.

MTA New Carrollton Property

This site occurs at the extreme eastern end of the corridor just north of US 50 and east of the MARC Penn Line in the New Carrollton segment. The parcel includes upland deciduous forest patches and old field. The forest is comprised of tulip poplar, sycamore, black locust, and black willow in the 6- to 12-inch dbh size class. Understory species include *Lonicera tatarica* (Tatarian honeysuckle) and multiflora rose. The old field habitat is comprised primarily of multiflora rose and Tatarian honeysuckle.

Haig Court Site

This site is on the south side of River Road in the Riverdale Park segment. The parcel is comprised of early successional regrowth vegetation, including invasive tree-of-heaven and Siberian elm, black locust, and Virginia pine in the 2- to 6-inch dbh size class. Little understory is present where pine dominates. Elsewhere, common understory species include multiflora rose, Tatarian honeysuckle, and *Lespedeza cuneata* (sericea lespedeza), all non-native invasive species.

Lyttonsville Maintenance Facility

This site is just west of the Georgetown Branch Trail and east of Rock Creek in the Bethesda/Chevy Chase segment. Much of the site is existing parking lots or buildings. However, a small clump of deciduous trees occur within the site north and south of Lyttonsville Place. The canopy trees are comprised primarily of tulip poplar. The understory is comprised of disturbance-tolerant species, including Tatarian honeysuckle and blackberry.

Significant Trees

Significant trees with a dbh size of 30 inches or greater or with a diameter that is at least 75 percent of the state champion tree for a given species were not specifically identified within the project corridor during this stage of the planning process. However, forested areas and neighborhoods with street trees that appeared to contain numbers of significant trees were mapped for identification, delineation, and surveying following the selection of a preferred alternative.

Effects

As indicated in the existing conditions section of this document, the corridor is located within urban and suburban areas that continue to support areas of natural habitat. Larger natural habitat areas are found within the stream valleys, while smaller patches of mostly disturbed vegetation occur in small community parks or residential areas, commercial areas, and along small tributary streams. Impacts to non-forested habitats such as managed lawns, landscaped areas, and old field habitat would occur from all of the potential Build Alternatives. However, these impacts

should be relatively minor, as the Build Alternatives will generally follow within or along existing roadways. In many locations, managed lawns and landscaped areas would likely be restored following construction. Forested habitat impacts would also result from all of the potential Build Alternatives and their component options as shown in **Table 2-17**. Alternative 5 with the Thayer option would impact the largest area of forest (24.62 acres), while Alternative 3 would impact the smallest area (10.70 acres). These impacts numbers would be expected to decrease once the engineering and design of each of alternative is refined, as the impacts shown in the tables below reflect a footprint of the greatest potential extent of impact.

Table 2-17: The Aerial Extent of Forest Impacts Associated with the BRT and LRT Alternatives in Acres

Low Invest. BRT	Medium Invest. BRT	Medium Invest. BRT w/ Preinkert Drive	High Invest. BRT	High Invest. BRT w/ Thayer Option	Low Invest. LRT	Medium Invest. LRT	Medium Invest. LRT w/ Preinkert Drive	High Invest. LRT	High Invest. LRT w/ Thayer Option
10.70	19.89	20.25	21.97	24.62	17.48	18.77	19.13	20.32	22.96

All of the Maintenance and Storage Facility sites, except Lyttonsville, would have impacts to forest habitats as shown in **Table 2-18**. The North Veterans Parkway site would impact the largest area of forest habitats (23.47 acres). The disturbance of the heavily wooded parcels of North Veterans Parkway site and the Glenridge Maintenance Facility could cause substantial changes to the overall forest community and structure, as invasive plant species could extend into clearings created from the disturbance. Impacts to forest habitats within the MTA New Carrollton property and the Haig Court site are not anticipated to alter remaining forest communities, as most of these habitats already have a high percentage of invasives or have been previously disturbed due to adjacent development.

Table 2-18: The Aerial Extent of Forest Impacts Associated with the Maintenance and Storage Facility Sites (Acres)

North Veterans Parkway Site	Glenridge Maintenance Facility	MTA New Carrollton Property	Haig Court Site	Lyttonsville Maintenance Facility
23.47	5.30	1.64	7.75	0.00

Forests in Maryland are regulated under the Forest Conservation Act, Natural Resources Article, Section 5-1609, Annotated Code of Maryland. Before a sediment and erosion control permit is issued for a project, the Act requires that a Forest Stand Delineation (FSD) and a Forest Conservation Plan (FCP) be submitted and approved by the DNR, Forestry Division. A more

detailed forest assessment, including preparation of a FSD and FCP, will need to be completed for the project once an alternative has been selected and more detailed designs have been completed. The FSD will follow the methodology of the State Forest Conservation Technical Manual (DNR 1995). All forest impacts would be addressed and mitigated in compliance with the Act, which requires the minimization of clearing and cutting of forests and mitigation in the form of reforestation at a 1:1 ratio for unavoidable impacts.

2.7.2. Terrestrial Wildlife

The presence of terrestrial wildlife within the project corridor is a function of available habitats. Because of the urban and built up land uses present within the corridor, native wildlife species are expected to be primarily restricted to less developed areas, such as the riparian corridors of Rock Creek, Sligo Creek, Northwest Branch, Paint Branch, Northeast Branch, and an unnamed tributary to Brier Ditch.

Methods

Information on wildlife within the project corridor was obtained from observations noted during fieldwork evaluating other natural resources and from published or unpublished data collected from outside sources. Specific data on breeding birds within Montgomery County was obtained from the MCDEP for the Lower Rock Creek and Sligo Creek portions of the study corridor. Additional breeding bird data were obtained and used with permission from the second Maryland and District of Columbia Breeding Bird Atlas Project (Breeding Bird Atlas Explorer online resource 2006; accessed September 27, 2007; interim results used with permission from the Maryland Ornithological Society, DNR, and USGS Patuxent Wildlife Research Center).

MCDEP data were collected from 10-minute point counts conducted from five sample locations within a 1-kilometer circle randomly selected within the county. Data used in this report were obtained from three count circles (Station 17-19) within the Lower Rock Creek watershed and two count circles (Station 5-6) within the Sligo Creek watershed on or adjacent to the project corridor. Sampling took place within the Lower Rock Creek watershed between June 1-16, 2003 and within the Sligo Creek watershed between June 19-23, 2001.

Existing Conditions

Wildlife habitat along the Georgetown Branch Trail right-of-way within the Bethesda/Chevy Chase segment at the western end of the study corridor is characterized as urban edge. Urban edge refers to the linear strip of shrubs and trees that runs along the right-of-way for a large portion of an alignment. In several areas, this border of trees broadens to become connected with remnant areas of upland forest where canopy coverage is relatively uninterrupted. These narrow strips of forest and shrub vegetation provide habitat for disturbance-tolerant species and species adapted to urban/suburban environments. Wildlife use of these areas is expected to be limited because of their relatively small size, limited cover, and general isolation from larger vegetated corridors. Common species in these types of habitats as transients or residents include *Procyon lotor* (raccoon), *Sciurus carolinensis* (gray squirrel), *Didelphis virginiana* (Virginia opossum), *Sylvilagus floridanus* (eastern cottontail), *Marmota monax* (groundhog), *Peromyscus leucopus* (white-footed mouse), *Zenaida macroura* (mourning dove), *Thryothorus ludovicianus* (Carolina

wren), *Turdus migratorius* (American robin), *Dumetella carolinensis* (gray catbird), *Mimus polyglottos* (northern mockingbird), *Sturnus vulgaris* (European starling), *Melospiza melodia* (song sparrow), *Zonotrichia albicollis* (white-throated sparrow), *Cardinalis cardinalis* (northern cardinal), *Quiscalus quiscula* (common grackle), *Carpodacus mexicanus* (house finch), *Carduelis tristis* (American goldfinch), and *Passer domesticus* (house sparrow).

Throughout much of the remainder of the corridor, the alignments follow existing roadways. Through urban sections, the roadways contain little to no vegetation except perhaps small, managed grass strips. Elsewhere, the alignment traverses roadways lined with street trees comprised principally of oaks with an open, grassy understory. Some sections contain large trees with spreading crowns that form a mostly contiguous canopy. Within these sections of the study corridor, few wildlife species occur besides gray squirrels and various resident birds, such as *Cyanocitta cristata* (blue jay), *Melanerpes carolinus* (red-bellied woodpecker), and *Picoides pubescens* (downy woodpecker).

The portions of the corridor with the largest blocks of more mature forest habitat occur within the stream valleys crossed by the study alignment, as illustrated in **Figure 2-5**. As indicated above, these stream valleys include Rock Creek, Sligo Creek, Northwest Branch, Paint Branch, Northeast Branch, and an unnamed tributary to Brier Ditch. These forested sections of the corridor provide habitat to many forest and forest edge species of wildlife. Wildlife in these areas likely include *Odocoileus virginianus* (white-tailed deer), *Vulpes vulpes* (red fox), gray squirrel, *Glaucomys volans* (southern flying squirrel), *Tamias striatus* (eastern chipmunk), raccoon, Virginia opossum, *Mephitis mephitis* (striped skunk), white-footed mouse, *Terrapene carolina* (eastern box turtle), *Elaphe obsoleta obsoleta* (black rat snake), and *Bufo americanus* (American toad). According to the MCDEP breeding bird data and the 2002-2006 Maryland-D.C. Breeding Bird Atlas Project, 91 species of birds were reported as at least possibly breeding within these riparian and adjacent developed areas, including such notable species as *Nyctanassa violacea* (yellow-crowned night-heron) and *Megascops asio* (eastern screech-owl) (Breeding Bird Atlas Explorer online resource 2007).

A detailed one-day survey of all biological organisms within the Rock Creek Park Nature Center was conducted on May 18, 2007. This effort, known as a Bioblitz, was done with assistance from the National Geographic Society, United States National Park Service, scientists, and many amateur volunteers. While the Nature Center lies approximately 2.5 miles downstream of where the project alignment would cross Rock Creek, the riparian habitats are similar. The Bioblitz effort documented 666 individual organisms, including 17 species of amphibians and reptiles, 12 species of mammals, and 29 species of birds (National Geographical Society Bioblitz online resources http://www.nationalgeographic.com/bioblitz/#tally).

The larger forest patches along the corridor also serve as habitat for forest interior dwelling bird species (FIDS). FIDS depend upon large, contiguous forest stands to successfully breed and produce sustainable populations. Within Maryland's Chesapeake Bay Critical Area (lands within 1,000 feet of tidal waters), FIDS are regulated through the protection of forest interior habitat (COMAR 1992). While the Critical Area law does not extend outside this zone and the suitable FIDS habitat within the corridor occurs outside of the Critical Area, the decline of FIDS

and FIDS habitat has created awareness of the conservation needs for this group of birds throughout the state, region, and hemisphere. FIDS typically require forests of at least 100 acres or riparian forest at least 300 feet wide to maintain viable breeding populations (Robbins et al. 1989). The Critical Area program recognizes 25 species of FIDS that could breed within forest interior habitats of Maryland's coastal plain (Jones et al. 2001). **Table 2-19** lists the species of FIDS recorded during the 2002-2006 Maryland-D.C. Breeding Bird Atlas Project that possibly breed within the larger forest tracts of the project corridor.

Table 2-19: List of FIDS Recorded within the Corridor

Common Name	Scientific Name
Red-shouldered Hawk[1]	*Buteo lineatus*
Broad-winged Hawk[1]	*Buteo platypterus*
Barred Owl[1]	*Strix varia*
Hairy Woodpecker	*Picoides villosus*
Pileated Woodpecker	*Dryocopus pileatus*
Acadian Flycatcher	*Empidonax virescens*
Veery	*Catharus fuscescens*
Wood Thrush	*Hylocichla mustelina*
Yellow-throated Vireo	*Vireo flavifrons*
Red-eyed Vireo	*Vireo olivaceus*
Northern Parula	*Parula americana*
Black-and-white Warbler[1]	*Mniotilta varia*
American Redstart[1]	*Setophaga ruticilla*
Ovenbird	*Seiurus aurocapillus*
Louisiana Waterthrush[1]	*Seiurus motacilla*
Scarlet Tanager	*Piranga olivacea*

Source: *Breeding Bird Atlas Explorer (online resource). 2007. USGS Patuxent Wildlife Research Center & National Biological Information Infrastructure. Accessed September 27, 2007. http://www.pwrc.usgs.gov/bba. Data compiled from: Maryland and the District of Columbia Breeding Bird Atlas 2002-2006. Maryland Ornithological Society. Interim results used with permission.*

[1] Highly area-sensitive species most vulnerable to forest loss, fragmentation, and overall habitat degradation.

Effects

Because the alternatives will mostly follow existing roadway alignments, impacts to wildlife resources are anticipated to be minor, and any wildlife corridors, especially within the stream valley parks will be maintained.

The largest areas of potential impact to terrestrial wildlife would occur within the proposed maintenance and storage facility sites. The North Veterans Parkway site and the Haig Court site would impact large patches of forested habitat, forcing wildlife into smaller patches of remaining forest. Site 2 would impact a small patch of forest that is contiguous with a much larger forest stand. This would result in an encroachment impact, but larger areas of forest habitat would remain outside of the site. The MTA New Carrollton property would impact mostly disturbed old field habitat. Fewer wildlife species likely occur in these disturbed sites surrounded by developed land, so impacts would likely be minor.

Impacts to FIDS habitat is also anticipated to be minor for the same reasons stated in paragraph one of this section. The only areas of forest interior habitat occur within the Rock Creek stream valley, the large forested area east of Northwest Branch and north of University Boulevard, and north of Campus Drive within the Paint Branch Stream Valley Park. The transitway alignment will follow an existing trail or existing roadways through these FIDS habitat areas creating minor encroachment impacts necessary to accommodate the transitway. This minor encroachment on the edges of FIDS habitat will minimize the extent of impact to forest interior that would occur if the transitway alignment were to bisect undisturbed FIDS habitat.

2.7.3. Aquatic Biota

Fish

Methods

Data relating to aquatic biota were gathered from the MCDEP, PGDER, and DNR Maryland Biological Stream Survey (DNR MBSS). Sites were selected within a 2-mile-wide area around the corridor, as illustrated in **Figure 2-3**. For the purposes of this study, only data collected since 2000 were considered recent enough to represent existing conditions in the corridor.

DNR and MCDEP have both developed a Fish Index of Biological Integrity (FIBI) that compares the fish community at a given site to reference fish communities in the least-impaired streams. Both of these FIBIs are based on the same principles of measuring a community using a set of comparative metrics. However, the DNR FIBI is based on statewide reference streams and uses nine community metrics found to characterize fish community health in Maryland's Piedmont streams. PGDER follows the DNR methods of sampling and analysis; consequently PGDER and DNR data are directly comparable. The MCDEP FIBI was developed using reference streams that are only located in Montgomery County and the scoring of the nine metrics used is adapted specifically to conditions within the county. This difference in the metrics and scoring criteria causes FIBI scores and narrative rankings to also differ between DNR/PGDER and MCDEP. **Table 2-20** summarizes how each agency ranks each FIBI score and how each of these scores and rankings relates to reference conditions.

Table 2-20: DNR/PGDER and MCDEP FIBI Scores and Rankings

FIBI Score	Narrative Ranking	Characteristics
DNR/PGDER		
4.0 – 5.0	Good	Comparable to reference streams considered to be minimally impacted, biological metrics fall within the upper 50 percent of reference site conditions.
3.0 – 3.9	Fair	Comparable to reference conditions, but some aspects of biological integrity may not resemble the qualities of minimally impacted streams.
2.0 – 2.9	Poor	Significant deviation from reference conditions, indicating some degradation. On average, biological metrics fall below the 10th percentile of reference site values.

Table 2-20: DNR/PGDER and MCDEP FIBI Scores and Rankings

FIBI Score	Narrative Ranking	Characteristics
1.0 - 1.9	Very Poor	Strong deviation from reference conditions, with most aspects of biological integrity not resembling the qualities of minimally impacted streams, indicating severe degradation. On average, most or all metrics fall below the 10th percentile of reference site values.
MCDEP		
>4.5	Excellent	Comparable to the biological community found in reference streams. Exceptional assemblage of species with a balanced community composition.
3.5 –4.5	Good	Decreased number of sensitive species; decreased number of specialized feeding groups with some intolerant species present.
2.3 – 3.4	Fair	Intolerant and sensitive species are largely absent; unbalanced feeding group structure.
≤ 2.2	Poor	Top carnivores and many expected species are absent or rare; general feeders and tolerant species dominate.

Source: Roth et. al. 1997, MCDEP 1998, and PGDER 1995

Existing Conditions

Overall, 38 species of fish have been collected within the project corridor since 2000 (**Table 2-21**). Two species of game fish, largemouth bass and smallmouth bass, were collected. Of the 38 species, the American eel and sea lamprey, are regarded as a migratory species. Two MCDEP sites were located within the Little Falls subwatershed. No fish were collected at these sites.

Eight MCDEP sites were located in the Rock Creek subwatershed. These sites had a FIBI ranging from 1.2 (Poor) to 3.4 (Fair) as shown in **Table 2-22**. The Rock Creek sites showed a relatively diverse fish community comprised of 21 species. Six of these species are considered to be pollution intolerant. No game fish were collected at these sites. One migratory species was present, the American eel.

Five sites, sampled by MCDEP, were located within the Sligo Creek subwatershed. At these sites, FIBI scores ranged from 1.7 (Poor) to 2.6 (Fair). These sites showed moderate diversity with only 11 different species of fish collected. Of these 11 species, more than 50 percent are considered to be pollution tolerant. No game fish or migratory fish species were collected in the Sligo Creek subwatershed.

Table 2-21: Summary of Existing Fish Community Data in Purple Line Watersheds

Agency	Site	Subwatershed	FIBI Range	FIBI Narrative
MCDEP	LFLF102	Little Falls	1*	Poor
MCDEP	LFLF104	Little Falls	1*	Poor
MCDEP	LRCR101A	Rock Creek	1.2	Poor
MCDEP	LRCR101B	Rock Creek	1.4	Poor
MCDEP	LRLR205	Rock Creek	1.4-1.9	Poor
MCDEP	LRLR418	Rock Creek	2.8-3.4	Fair
MCDEP	LRLR422B	Rock Creek	2.9	Fair
MCDEP	LRLR422D	Rock Creek	2.8	Fair
MCDEP	LRLR425	Rock Creek	1.9-3	Poor-Fair
MCDEP	LRLR426	Rock Creek	2.1-2.8	Poor-Fair
MCDEP	SCFT101	Sligo Creek	2.1	Poor
MCDEP	SCSC301	Sligo Creek	1.9	Poor
MCDEP	SCSC303B	Sligo Creek	2.1	Poor
MCDEP	SCSC303C	Sligo Creek	1.9	Poor
MCDEP	SCSC314	Sligo Creek	1.7-2.6	Poor-Fair
MCDEP	NWNW421	Northwest Branch	3.4-4.3	Fair-Good
DNR	ANAC-118-R-2004	Northeast Branch (Paint Branch)	3.67	Fair
PGDER	07-008B	Northeast Branch (Indian Creek)	2.75	Poor
PGDER	19-023A	Lower Beaverdam Creek	2.25	Poor
PGDER	19-025	Lower Beaverdam Creek	3	Fair
PGDER	19-0436	Lower Beaverdam Creek	2.5	Poor
PGDER	19-040A	Lower Beaverdam Creek	2.5	Poor

Source: MCDEP Database, DNR MBSS Database, PGDER Sampling

* No fish collected

Table 2-22: Fish Species Documented in Purple Line Watersheds

Fish Species	Pollution Tolerance	Little Falls	Rock Creek	Sligo Creek	Northwest Branch	Northeast Branch	Lower Beaverdam Creek
American eel *(Anguilla rostrata)*	No type		X		X	X	X
Banded killifish *(Fundulus diaphanus)*	No type					X	X
Blacknose dace *(Rhinichthys atratulus)*	**T**		X	X	X	X	X
Blue ridge sculpin *(Cottus caeruleomentum)*	No type			X			
Bluegill *(Lepomis macrochirus)*	**T**		X	X	X	X	X
Bluntnose minnow *(Pimephales notatus)*	**T**		X		X		
Brown bullhead *(Ameiurus nebulosus)*	**T**			X	X		
Channel catfish *(Ictalurus punctatus)*	No type				X		
Common carp *(Cyprinus carpio)*	No type		X				
Common shiner *(Luxilus cornutus)*	**I**				X		
Creek chub *(Semotilus atromaculatus)*	**T**		X	X	X	X	
Creek chubsucker *(Erimyzon oblongus)*	No type					X	X
Cutlips minnow *(Exoglossum maxillingua)*	**I**		X		X		
Eastern mosquitofish *(Gambusia holbrooki)*	No type					X	X
Eastern mudminnow *(Umbra pygmaea)*	**T**					X	
Fallfish *(Semotilus corporalis)*	**I**		X				

Table 2-22: Fish Species Documented in Purple Line Watersheds

Fish Species	Pollution Tolerance	Little Falls	Rock Creek	Sligo Creek	Northwest Branch	Northeast Branch	Lower Beaverdam Creek
Fantail darter *(Etheostoma flabellare)*	No type				X		
Golden redhorse *(Moxostoma erythrurum)*	No type				X		
Golden shiner *(Notemigonus crysoleucas)*	**T**		X				X
Goldfish *(Carssius auratus)*	No type		X				
Green sunfish *(Lepomis cyanellus)*	**T**		X	X		X	X
Lepomis hybrid *(Lepomis sp.)*	No type			X			X
Largemouth bass *(Micropterus salmoides)*	**T**				X	X	
Longnose dace *(Rhinichthys cataractae)*	No type		X	X	X		
Mummichog *(Fundulus heteroclitus)*	No type						X
Northern hogsucker *(Hypentelim nigricans)*	**I**		X		X		
Pumpkinseed *(Lepomis gibbosus)*	**T**		X		X	X	X
Redbreast sunfish *(Lepomis auritus)*	**I**		X		X	X	X
Rosyside dace *(Clinostomus funduloides)*	**I**				X		
Satinfin shiner *(Cyprinella analostana)*	**I**				X	X	X
Sea lamprey *(Petromyzon marinus)*	**I**					X	
Smallmouth bass *(Miropterus dolomieu)*	No type				X		
Spotfin shiner *(Cyprinella spilopterus)*	**I**		X		X		

Table 2-22: Fish Species Documented in Purple Line Watersheds

Fish Species	Pollution Tolerance	Little Falls	Rock Creek	Sligo Creek	Northwest Branch	Northeast Branch	Lower Beaverdam Creek
Spottail shiner *(Notropis hudsonius)*	**I**		X		X	X	X
Swallowtail shiner *(Notropis procne)*	No type		X	X	X		X
Tessellated darter *(Etheostoma olmstedi)*	**T**		X	X	X	X	
White sucker *(Catostomus commersoni)*	**T**		X	X	X	X	X
Yellow bullhead *(Ameiurus natalis)*	No type		X				
Total Number of Species		**0**	**21**	**11**	**24**	**17**	**16**

Source: MCDEP Database, DNR MBSS Database, PGDER Sampling
T = Pollution Tolerant **I** = Pollution Intolerant

Only one site sampled by MCDEP was located in the Northwest Branch subwatershed. The MCDEP FIBI ratings for this site ranged from 3.4 (Fair) to 4.3 (Good), and showed a diverse fish community with 24 species. Of these species, more than 30 percent are considered to be pollution intolerant and more than 37 percent to be pollution tolerant. At this site, two species of game fish were present, largemouth bass and smallmouth bass. One migratory fish species was present, the American eel.

Two sites were located in the Northeast Branch subwatershed. One site sampled by DNR was rated as having a FIBI of 3.67 (Fair). The other site was sampled by PGDER and rated the site as having a FIBI of 2.75 (Poor). Seventeen species of fish were documented in this subwatershed. Fifty percent of these species are regarded as pollution-tolerant species. Three pollution-intolerant species of fish were documented in the Northeast Branch subwatershed. One species of game fish, largemouth bass, was collected in the Northeast Branch. Two migratory fish were found at these sites, the American eel and sea lamprey.

Four sites, sampled by PGDER, were located in the Lower Beaverdam Creek subwatershed. The FIBI at these sites ranged from 2.25 (Poor) to 3.00 (Fair). These sites showed moderate diversity with 16 different species of fish collected. Of these 16 species, more than 37 percent are considered to be pollution tolerant. No game fish were collected at these sites. The American eel was the only migratory species found in the Lower Beaverdam Creek subwatershed.

Benthic Macroinvertebrates

Methods

DNR and MCDEP have both developed a Benthic Index of Biotic Integrity (BIBI) that compares the macroinvertebrate community within a given site to reference macroinvertebrate communities in a least-impaired stream. The DNR BIBI is based on statewide reference streams and uses nine community metrics found to characterize macroinvertebrate community health in Maryland's Piedmont streams. For its sampling, PGDER follows the DNR methods of sampling and analysis, so PGDER and DNR data are directly comparable. The MCDEP BIBI was developed using reference streams only within Montgomery County, and the scoring of the nine metrics used is tailored specifically to conditions within the county. Because the metrics and scoring criteria differ, the resulting BIBI scores and narrative rankings are also different between DNR/PGDER and MCDEP. **Table 2-23** summarizes how each agency ranks each BIBI score and how each of these scores and rankings relates to reference conditions.

Table 2-23: DNR/PGDER and MCDEP BIBI Scores and Rankings

BIBI Score	Narrative Ranking	Characteristics
DNR/PGDER		
4.0 – 5.0	Good	Comparable to reference streams considered to be minimally impacted, biological metrics fall within the upper 50 percent of reference site conditions.
3.0 – 3.9	Fair	Comparable to reference conditions, but some aspects of biological integrity may not resemble the qualities of minimally impacted streams.
2.0 – 2.9	Poor	Significant deviation from reference conditions, indicating some degradation. On average, biological metrics fall below the 10th percentile of reference site values.
1.0 - 1.9	Very Poor	Strong deviation from reference conditions, with most aspects of biological integrity not resembling the qualities of minimally impacted streams, indicating severe degradation. On average, most or all metrics fall below the 10th percentile of reference site values.
MCDEP		
$\geq$ 35	Excellent	Comparable to the biological community found in reference streams. Exceptional assemblage of species with a balanced community composition.
26 – 34	Good	Decreased number of sensitive species; decreased number of specialized feeding groups with some intolerant species present.
17 – 25	Fair	Intolerant and sensitive species are largely absent; unbalanced feeding group structure.
$\leq$ 17	Poor	Top carnivores and many expected species are absent or rare; general feeders and tolerant species dominate.

Existing Conditions

Within the Little Falls subwatershed, BIBI scores were Poor as shown in **Table 2-24**. The macroinvertebrate community within the Little Falls subwatershed is generally dominated by pollution-tolerant midges (Chironomidae) and common net-spinning caddisflies (Hydropsychidae).

Table 2-24: Summary of Existing Benthic Macroinvertebrate Community Data for Purple Line Watersheds

Agency	Site	Subwatershed	BIBI Score	BIBI Narrative
MCDEP	LFLF102	Little Falls	10-16	Poor
MCDEP	LFLF104	Little Falls	10-14	Poor
MCDEP	LRCR101A	Rock Creek	18	Fair
MCDEP	LRCR101B	Rock Creek	12	Poor
MCDEP	LRLR205	Rock Creek	22	Fair
MCDEP	LRLR418	Rock Creek	10-12	Poor
MCDEP	LRLR422A	Rock Creek	16	Poor
MCDEP	LRLR422B	Rock Creek	8-16	Poor
MCDEP	LRLR422C	Rock Creek	12	Poor
MCDEP	LRLR422E	Rock Creek	10	Poor
MCDEP	LRLR425	Rock Creek	8-12	Poor
MCDEP	LRLR426	Rock Creek	8	Poor
MCDEP	SCFT101	Sligo Creek	14	Poor
MCDEP	SCSC314	Sligo Creek	8-12	Poor
MCDEP	NWNW421	Northwest Branch	13	Poor
DNR	ANAC-118-R-2004	Northeast Branch (Paint Branch)	3.57	Fair
PGDER	05-001	Northeast Branch (Paint Branch)	2.43	Poor
PGDER	05-004	Northeast Branch (Paint Branch)	2.14	Poor
PGDER	07-008B	Northeast Branch (Indian Creek)	4.14	Good
PGDER	19-023B	Lower Beaverdam Creek	1.85	Very Poor
PGDER	19-025	Lower Beaverdam Creek	1.57	Very Poor
PGDER	19-036	Lower Beaverdam Creek	1.57	Very Poor
PGDER	19-040A	Lower Beaverdam Creek	1.85	Very Poor

Source: MCDEP Database, DNR MBSS Database, PGDER Sampling

Ten sites were located within the Rock Creek subwatershed in the corridor. These sites were documented by MCDEP as having BIBI scores ranging from 8 (Poor) to 22 (Fair); however, 70 percent are rated as Poor. Generally within Rock Creek, benthic macroinvertebrate communities were comprised of pollution-tolerant midges and net-spinning caddisflies with some sites that scored in the Fair range containing greater numbers of less tolerant damselfly and mayfly larvae.

The MCDEP recorded BIBI scores for two sites in the Sligo Creek subwatershed; both were rated as Poor. The benthic macroinvertebrate community within Sligo Creek is almost exclusively comprised of tolerant midge taxa.

The macroinvertebrate community of Northwest Branch was rated as Poor by MCDEP. These communities were also dominated by midges with the addition of several less tolerant taxa, including mayflies.

The Northeast Branch subwatershed was rated Fair by DNR and Poor to Good by PGDER. The sites exhibited greater taxa diversity than the other subwatersheds sampled.

All sites sampled within Lower Beaverdam Creek were rated as Very Poor by PGDER and were heavily dominated by pollution-tolerant midges.

Physical Habitat

Each agency from which biological data were collected uses its own habitat scoring and narrative ranking process. MCDEP uses EPA's Rapid Bioassessment Protocol for habitat scoring. This protocol is based on the quality of instream habitat, epifaunal substrate, embeddedness, channel alteration, channel flow status, bank vegetative protection, bank stability, and riparian vegetative zones. Through extensive sampling, the narrative ranking criteria in **Table 2-25** were developed by MCDEP specifically for streams within Montgomery County. Prince George's County also uses EPA's Rapid Bioassessment Protocol, but with ranking criteria developed specifically for streams within Prince George's County, shown in Table 2-25. The habitat assessment used by the DNR is specialized for both Piedmont and Coastal Plain streams. Within the Piedmont Physiographic Province, scores are based on remoteness, shading, epifaunal substrate, instream habitat, instream woody debris and rootwads, bank stability, riffle quality, and embeddedness. In the Coastal Plain Physiographic Province, scores are based on remoteness, shading, epifaunal substrate, instream habitat, instream woody debris and rootwads, and bank stability.

Table 2-25: MCDEP, PGDER, DNR Habitat Ranking Criteria

Score	Narrative
MCDEP	
166-200	Excellent
154-165	Good/Excellent
113-153	Good
101-112	Fair/Good
60-100	Fair
54-59	Poor/Fair
0-53	Poor
PGDER	
151-200	Comparable
126-151	Supporting
100-125	Partially Supporting
< 100	Non-supporting
DNR	
Score	Narrative
81-100	Minimally Degraded
66-80	Partially Degraded
51-65	Degraded
0-50	Severely Degraded

Source: MCDEP1998, PGDER 1995, and DNR 2003

In the Little Falls subwatershed, the MCDEP habitat scores ranged from Fair to Good/Excellent as shown in **Table 2-26**. The lowest parameter scores within the Little Falls subwatershed were bank stability and bank vegetation.

Table 2-26: Summary of Existing Habitat Data for Purple Line Watersheds

Agency	Site	Subwatershed	PHI Range	PHI Narrative
MCDEP	LFLF102	Little Falls	78-137	Fair-Good
MCDEP	LFLF104	Little Falls	92-155	Fair-Good/Excellent
MCDEP	LRCR101A	Rock Creek	81-111	Fair-Fair/Good
MCDEP	LRJB102	Rock Creek	93	Fair
MCDEP	LRLR205	Rock Creek	101-114	Fair/Good-Good
MCDEP	LRLR418	Rock Creek	80-117	Fair-Good
MCDEP	LRLR422A	Rock Creek	122	Good
MCDEP	LRLR422B	Rock Creek	98-134	Fair-Good
MCDEP	LRLR422C	Rock Creek	119	Good
MCDEP	LRLR422D	Rock Creek	92-111	Fair-Fair/Good
MCDEP	LRLR422E	Rock Creek	99	Fair
MCDEP	LRLR425	Rock Creek	89-127	Fair-Good
MCDEP	SCFT101	Sligo Creek	116-123	Good
MCDEP	SCSC314	Sligo Creek	88	Fair
MCDEP	NWNW421	Northwest Branch	85-162	Fair-Good/Excellent
DNR	ANAC-118-R-2004	Northeast Branch (Paint Branch)	86	Minimally Degraded
PGDER	07-008B	Northeast Branch (Indian Creek)	138	Supporting
PGDER	19-023B	Lower Beaverdam Creek	71	Non-supporting
PGDER	19-025	Lower Beaverdam Creek	90	Non-supporting
PGDER	19-036	Lower Beaverdam Creek	107	Partially Supporting
PGDER	19-040A	Lower Beaverdam Creek	119	Partially Supporting

Source: MCDEP Database, DNR MBSS Database, PGDER Sampling

The MCDEP rated 12 sites in the Rock Creek subwatershed from Fair to Good. The lowest parameter scores within the Rock Creek subwatershed were riparian vegetation, bank stability, and bank vegetation.

The MCDEP rated two sites in the Sligo Creek subwatershed from Fair to Good. The lowest parameter scores within the Sligo Creek subwatershed were bank stability, bank vegetation, and riparian vegetation.

One site on the Northwest Branch was documented by the MCDEP as Good aquatic habitat. The lowest parameter scores within the Northwest Branch subwatershed were bank stability, bank vegetation, and riparian vegetation.

The DNR PHI rated a site within the Northeast Branch subwatershed as Minimally Degraded. Also within the Northeast Branch subwatershed, the PGDER rated a site as Supporting. The

lowest parameter scores within the Northeast Branch subwatershed were bank stability, bank vegetation, and riparian vegetation.

The PGDER rated two sites in Lower Beaverdam Creek as Non-supporting and two sites as Partially Supporting. The lowest parameter scores within the Lower Beaverdam Creek were channel sinuosity, bank stability, and bank vegetation.

Effects

Effects to aquatic habitats and species are related to direct loss of habitat from project infrastructure such as culvert extensions and water quality degradation that could potentially occur from construction and operation of any of the Build Alternatives.

Potential impacts during construction include physical disturbances or alterations, accidental spills, and sediments releases that can affect aquatic life. Earth-moving activities will expose unstabilized soils that can be delivered to waterways during storm events. These increased sediment loads can destroy or damage fish spawning areas and macroinvertebrate habitat. An accidental sediment release in a stream can clog the respiratory organs of fish, macroinvertebrates, and the other members of their food web (Barrett 1998). Additional suspended sediment loads have also been shown to cause stream warming by reflecting radiant energy (CWP 2003). Many metal contaminants, bound to the small particles, are transported during accidental releases of sediment. Barrett (1995) found that the initial response to increased sedimentation due to construction was a reduction in numbers and species of fish and macroinvertebrates. This reduction in fish numbers in areas of siltation was generally reversed within 12 months of the cessation of construction activity. While sediment releases are possible during construction, the potential for sediment related impacts will be greatly minimized through the strict adherence to MDE-approved sediment and erosion control plans.

All of the Build Alternatives would reduce aquatic habitat within the corridor to some degree. Extension of culverts could lead to direct loss of fish and macroinvertebrates within the construction zone and would permanently alter the available habitat in the impact area. During operation of the Build Alternatives, the BRT and LRT would have similar potential to increase water quality degradation from stormwater runoff because greater impervious surfaces from either mode could affect water quality. However, for all alternatives the increase in overall imperviousness in any of the watersheds is very small. Because all of the impacted watersheds have already exceeded impervious thresholds for aquatic degradation, the small incremental impervious impacts that could be expected from the project are unlikely to affect aquatic habitat or the makeup of biological communities to an appreciable degree. Potential effects to aquatic habitat and water quality will be minimized by strict adherence to sediment and erosion control plans and SWM plans, which will be developed in accordance with state regulations to provide long-term mitigation of potential effects from stormwater. In addition, in-stream construction will not be performed during state mandated stream closure periods, which are from March 1 to June 15 for Class I streams and March 1 through May 31 for Class IV streams.

The construction of the maintenance and storage facilities would have a larger effect on aquatic biota than the BRT/LRT alignments, especially the North Veterans Parkway site and the MTA

New Carrollton property. A portion of a tributary to Brier Ditch would have to be placed in a culvert in order to access the North Veterans Parkway site from Veterans Parkway. The placement of this facilty in the currently forested riparian buffer of the stream would decrease shade within the stream, causing stream temperatures to rise. The streams located within the MTA New Carrollton property would most likely be piped as the entire site is a network of streams and wetlands that serve as the headwaters of Beaverdam Creek. Beyond the significant loss of habitat and increased macro-invertebrate/fish mortality, the downstream receiving waters of Beaverdam Creek could experience habitat degradation due to the loss of the wetland areas and increased imperviousness in the headwaters.

2.7.4. Rare, Threatened, and Endangered Species

Methods

The National Marine Fisheries Service (NMFS), USFWS, and DNR were contacted in February 2007 to determine the potential presence of state or federal rare, threatened, or endangered (RTE) species within the project corridor. In a letter dated April 12, 2007, the DNR Wildlife and Heritage Service stated that there are no state or federal records for rare, threatened, or endangered species within the boundaries of the project corridor (Appendix I). The NMFS stated in a letter sent March 19, 2007 and USFWS also stated in a letter sent March 27, 2007, that there are no species federally listed or proposed for listing as endangered or threatened within the project corridor (Appendix J).

Effects

Based on information provided by the DNR, NMFS, and USFWS, there are no state or federally known RTE species within the project corridor. Consequently, no impacts to RTE species are anticipated from the Purple Line project.

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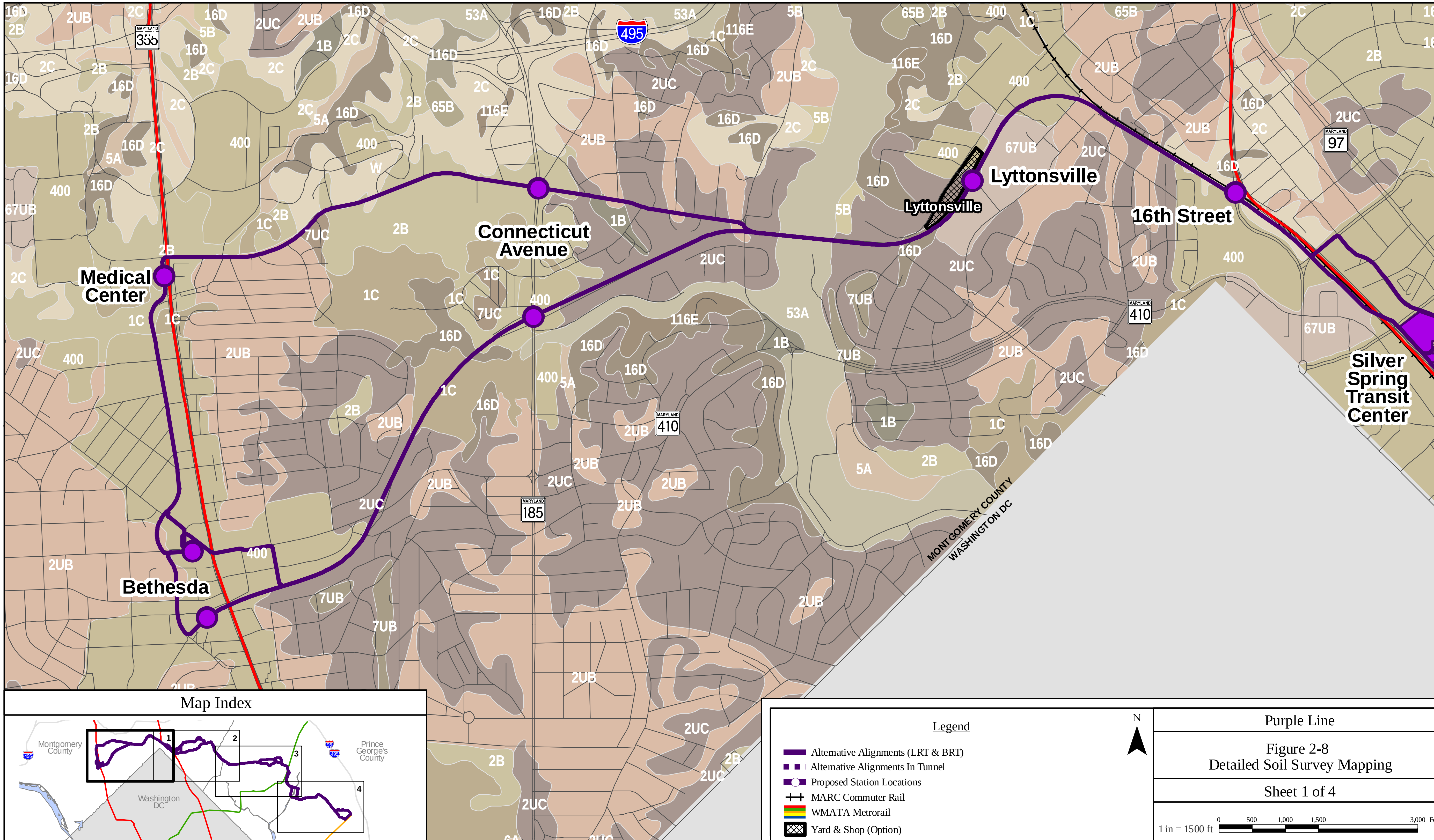
Appendix A

Detailed Soil Survey and Soils Table



Legend

- Alternative Alignments (LRT & BRT)
- Alternative Alignments In Tunnel
- Proposed Station Locations
- MARC Commuter Rail
- WMATA Metrorail
- Yard & Shop (Option)

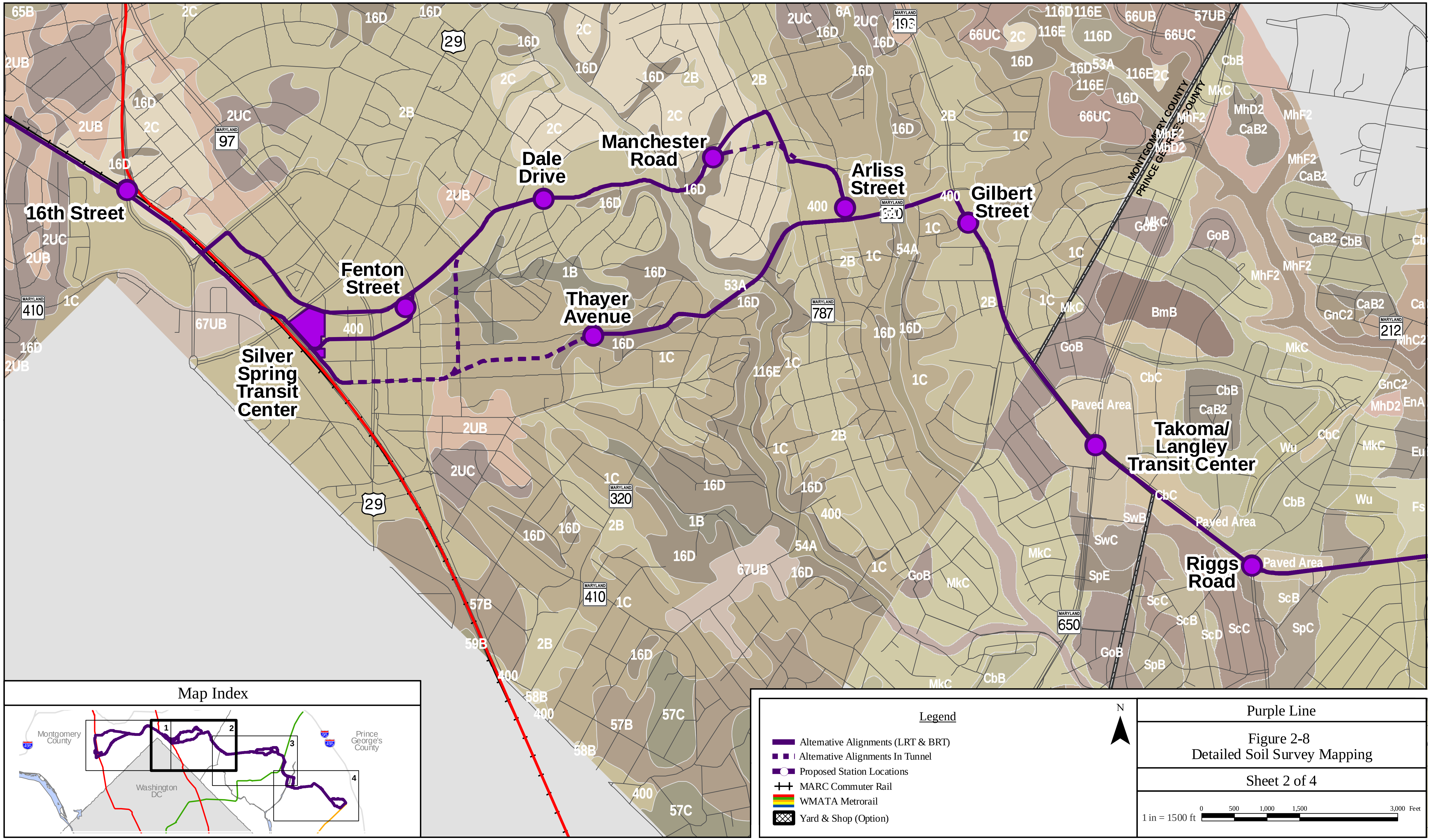
Purple Line

Figure 2-8
Detailed Soil Survey Mapping

Sheet 1 of 4

1 in = 1500 ft

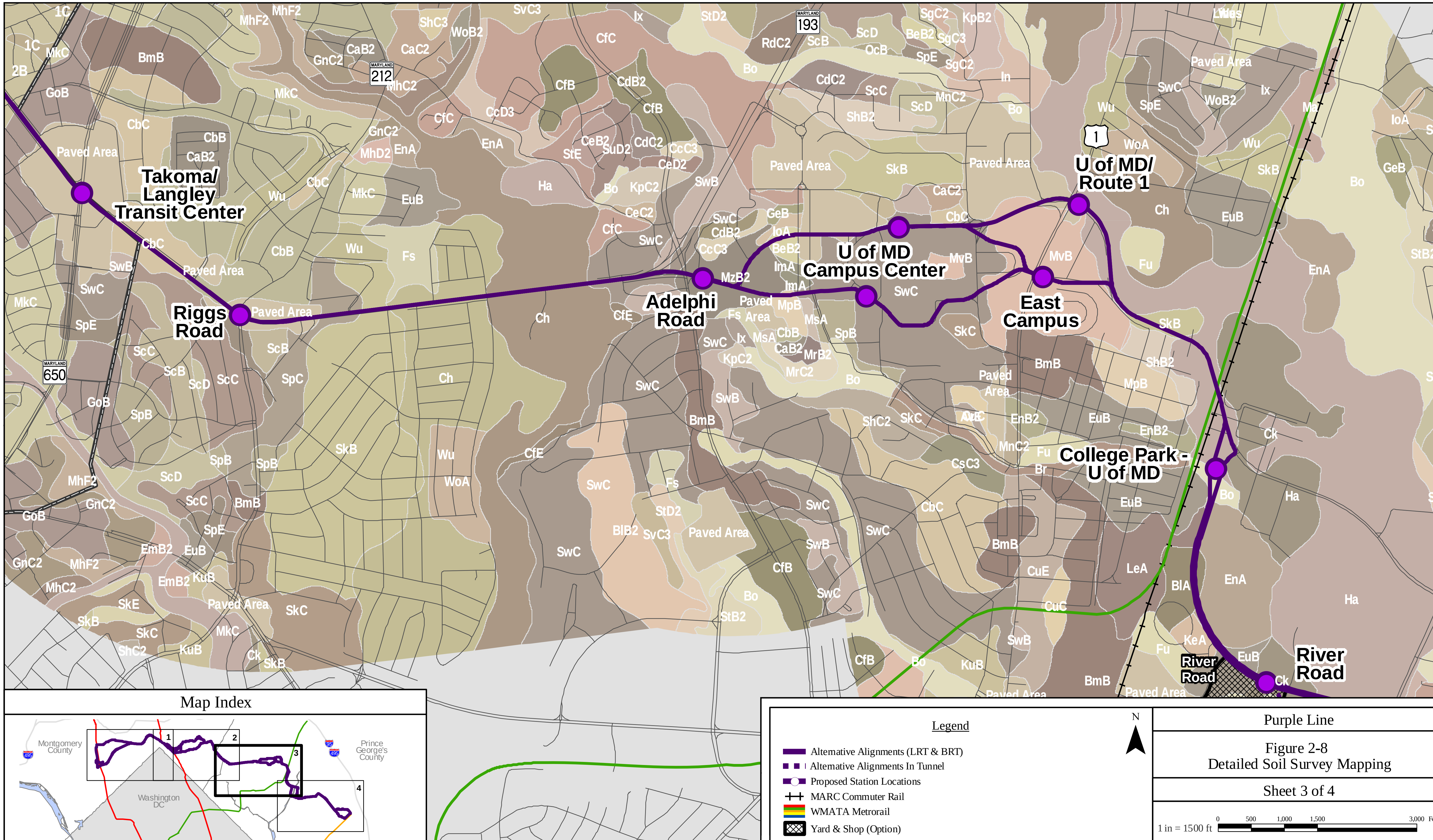
0 500 1,000 1,500 3,000 Feet



Purple Line

Figure 2-8
Detailed Soil Survey Mapping

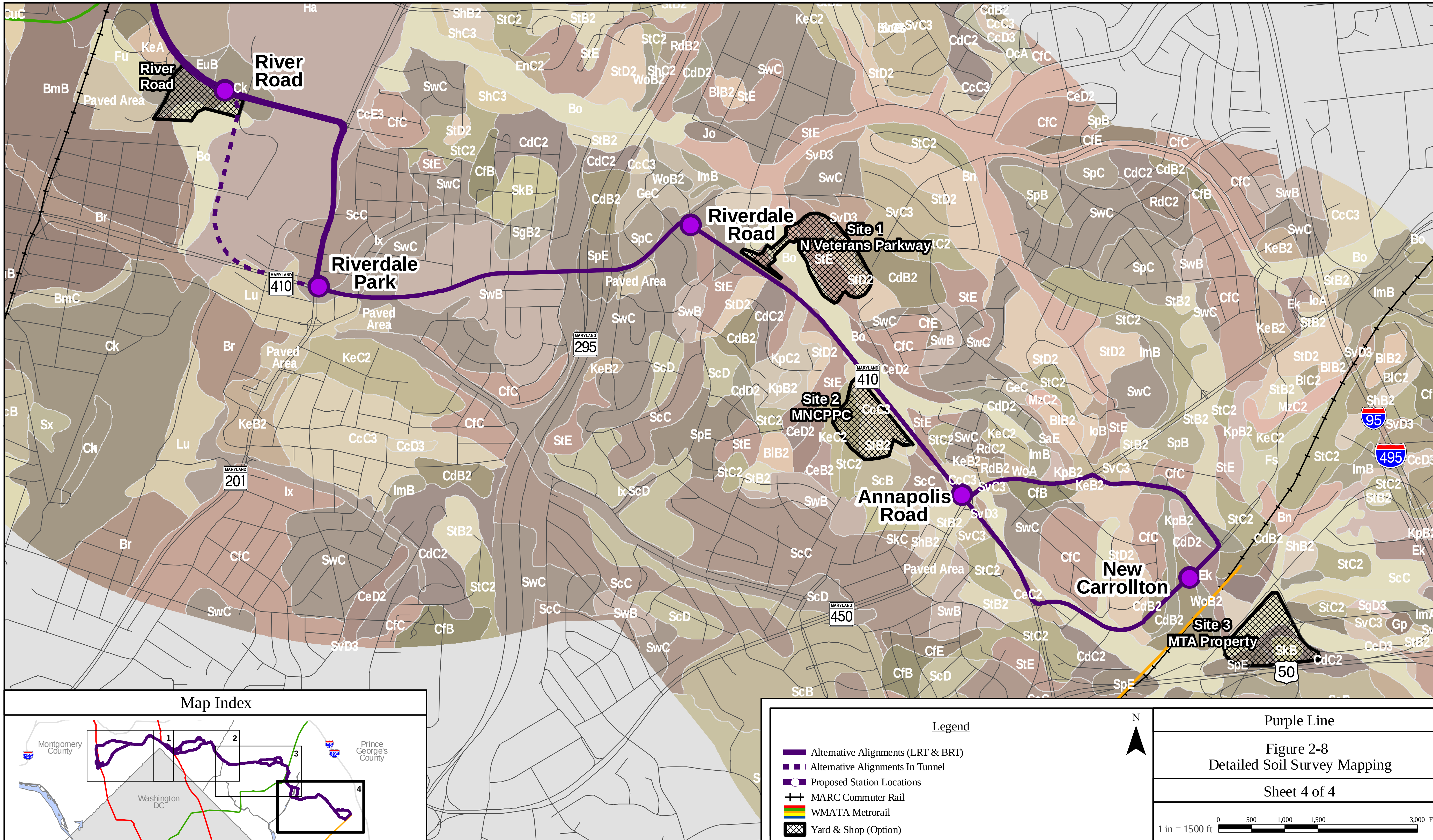
Sheet 2 of 4



Purple Line

Figure 2-8
Detailed Soil Survey Mapping

Sheet 3 of 4



Legend

- Alternative Alignments (LRT & BRT)
- Alternative Alignments In Tunnel
- Proposed Station Locations
- MARC Commuter Rail
- WMATA Metrorail
- Yard & Shop (Option)

N

Purple Line

Figure 2-8
Detailed Soil Survey Mapping

Sheet 4 of 4

1 in = 1500 ft

0 500 1,000 1,500 3,000 Feet

Appendix B
Jurisdictional Determination Letter
for the Georgetown Branch Project

DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, U.S. ARMY CORPS OF ENGINEERS
P.O. BOX 1715
BALTIMORE, MD 21203-1715

REPLY TO
ATTENTION OF

Operations Division

FEB 1 0 2003

Maryland Transit Administration
c/o Coastal Resources, Inc.
Attn: Sara Williamson
2988 Solomons Island Road
Edgewater, Maryland 21037

Dear Ms. Williamson:

This is in reference to your letter, dated December 16, 2002, regarding application CENAB-OP-RMS(MD MTA/PURPLE LINE: BETHESDA TO SILVERSPRING/JD) 03-61424-11, requesting a jurisdictional determination (JD) and verification of the delineation of Waters of the United States, within the Rock Creek watershed, including jurisdictional wetlands, on property located in Montgomery County, Maryland.

A field inspection was conducted by George Harrison of this office on July 12, 2002, with you in attendance. This inspection indicated that the delineation of Waters of the United States, including jurisdictional wetlands, within the "Area of Review" on the enclosed map is accurate. Those areas indicated as Waters of the United States, including non-tidal wetlands, are regulated by this office pursuant to Section 404 of the Clean Water Act. Enclosed is a document that outlines the basis of our determination of jurisdiction over these areas.

Please note that on March 28, 2000, an administrative appeals process was established for JDs. Enclosed is a JD appeals form that can be used if you believe the JD you received warrants further review. You may accept this JD, submit new information seeking reconsideration of the JD or appeal the JD. If you accept the JD, you do not need to notify the Corps. A JD will be reconsidered if you submit new information or data to the Baltimore District Engineer (DE) within 60 days from the date of this letter. If you decide to appeal the approved JD, please submit the attached form within 60 days from the date of this letter to our Regulatory Appeals Review Officer at the following address:

James W. Haggerty
Regulatory Appeals Review Officer
North Atlantic Division, US Army Corps of Engineers
Fort Hamilton Military Community
General Lee Avenue, Bldg 301
Brooklyn, NY 11252-6700

If we do not hear from you within 60 days, we will consider this JD accepted by you. This approved JD is valid for five years from the date of issuance unless new information warrants a revision before the expiration date.

You are reminded that any grading or filling of Waters of the United States, including jurisdictional wetlands, is subject to Department of the Army authorization. State and local authorizations may also be required to conduct activities in the locations. In addition, the Interstate Land Sales Full Disclosure Act may require that prospective buyers be made aware, by the seller, of the Federal authority over any Waters of the United States, including jurisdictional wetlands, being purchased.

This delineation/determination has been conducted to identify the limits of the Corps Clean Water Act jurisdiction for the particular site identified in this request. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985, as amended. If you or your tenant are USDA (United States Department of Agriculture) program participants, or anticipate participation in USDA programs, you should request a certified wetland delineation from the local office of the Natural Resources Conservation Service prior to starting work.

A copy of this letter will be furnished to the Maryland Department of the Environment. If you have any questions concerning this matter, please call George Harrison, of this office, at (410) 962-6002.

Sincerely,

for George Harrison

Walter Washington, Jr.
Chief, Maryland Section Southern

Enclosure

BASIS OF JURISDICTIONAL DETERMINATION

Applicant: Maryland Transit Administration
February 6, 2003 Date:
File No.: 200361424

1. The jurisdictional determination outlined in the attached letter was based on the following:

___ A. There are no Waters of the United States present at the site.
____ Does not meet any of the items listed below

___ B. The Waters of the United States present at the site are currently used, or were used in the past, or may be susceptible to use in interstate of foreign commerce. This includes waters which are subject to the ebb and flow of the tide.

___ C. The Waters of the United States at the site are interstate waters, including interstate wetlands.

___ D. The Waters of the United States at the site are other waters such as intrastate lakes, rivers, streams (including intermittent streams, mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes or natural ponds containing a nexus to interstate commerce).

The nexus to interstate commerce consists of:

__ recreational or other purposes
__ fish or shellfish
__ industrial or commercial purpose
__ habitat for migratory birds or game birds or wildlife
__ commercial saleable timber products
__ sand, gravel, oil, gas or other commodities of commerce
__ other________________________________

___ E. The Waters of the United States present at the site contain impoundments of waters otherwise defined as Waters of the United States

XXX F. The Waters of the United States present at the site are part of a tributary system to waters identified in B-E above.

___ G. The Waters of the United States present at the site are part of the territorial seas.

XXX H. There are wetlands present at the site which are adjacent to waters identified in B-G above.

2. The lateral extent of the Waters of the United States, including wetlands at the site identified on the accompanying map was based on one or more of the following:

XXX A. The presence of wetlands has been determined by the U.S. Army Corps of Engineers 1987 Wetlands Delineation Manual and guidance supporting the manual.

XXX B. Ordinary high water mark, mean high water mark, high tide line, mean high tide line.

George Harrison
Project Manager

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Maryland Transit Administration		File Number: 200361424	Date: February 6, 2003
Attached is:			See Section Below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of Permission)		A
	PROFFERED PERMIT (Standard Permit or Letter of Permission)		B
	PERMIT DENIAL		C
xxxx xxxx	APPROVED JURISDICTIONAL DETERMINATION		D
	PRELIMINARY JURISDICTIONAL DETERMINATION		E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations (JD) associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact: Sandy Zelen Regulatory Branch Baltimore District P.O. Box 1715 Baltimore, MD 21203-1715 (410) 962-6028 or 3670	If you only have questions regarding the appeal process you may also contact: James W. Haggerty Regulatory Appeals Review Officer North Atlantic Division, US Army Corps of Engineers Fort Hamiltion Military Community General Lee Avenue, Building 301 Brooklyn, NY 11252-6700 (718) 765-7150

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

_______________________ Signature of applicant or agent.	Date:	Telephone number:

Appendix C
Routine Wetland Delineation Forms and Stream Features Field Sheets

Stream Features
Field Sheet

Date: 6-27-07 Project Site: Purple Line Wetland # : 001

Observer(s): BG, MR, KR

Stream Flow:
Perennial: X Intermittent ______ Ephemeral ______

Gradient: <1% Classification: R2UB1

Approximate Drainage Basin: ______

Morphology:
Avg. Channel Width 4' Depth 2.5' Avg. Water Depth 3"

Has stream morphometry been altered? Yes Describe type and degree:
Channelized

Habitat and Pollutants:
Substrate (predominant type (s)): gravel

Habitat Complexity (Characterize) low, lack of cover, high % of algae

Bank Erosion: Severe ______ Moderate ✓ Minor ______

Describe: healing over

Silt Deposition: minor

Pollutants (observation / potential sources): SW's, road runoff

Stormwater Outfalls: from NIH

Riparian Zone:
Development: green space

Riparian vegetation: Forest X Shrubs ______ Herbs ______

Dominant Species: cypress, ash, mulberry, willow

Approximate % shading by woody species: 20%

Steepness of adjacent slopes: 1-5%

Notes: ______

Stream Features
Field Sheet

Date: 6-27-07 Project Site: Purple Line Wetland #: 002

Observer(s): BG, MR, KR

Stream Flow:
Perennial: ______ Intermittent X Ephemeral ______

Gradient: ______ Classification: R4SB2

Approximate Drainage Basin: ______

Morphology:
Avg. Channel Width 8' Depth 10' Avg. Water Depth no water

Has stream morphometry been altered? yes Describe type and degree:
Entrenched channel w/ vertical banks - covered in invasives.

Habitat and Pollutants:
Substrate (predominant type (s)): Sand

Habitat Complexity (Characterize) low - no flows

Bank Erosion: Severe X Moderate ______ Minor ______

Describe: vertical banks

Silt Deposition: moderate

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: Ø

Riparian Zone:
Development: none

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: Norway maple, T.P, Sycamore
ground ivy, bamboo,

Approximate % shading by woody species: 95%

Steepness of adjacent slopes: 1-10%

Notes:

Stream Features
Field Sheet

mainstem of Sligo Creek

Date: 6-27-07 Project Site: Purple Line Wetland #: 003

Observer(s): BG, MR, KR

Stream Flow:
Perennial: X Intermittent ______ Ephemeral ______

Gradient: 1% Classification: R3UB1

Approximate Drainage Basin: ______

Morphology:
Avg. Channel Width 15' Depth 6' Avg. Water Depth 1'

Has stream morphometry been altered? yes Describe type and degree:
straightened through culvert

Habitat and Pollutants:
Substrate (predominant type (s)): gravel / sand

Habitat Complexity (Characterize) moderate - deep pools; some undercut banks

Bank Erosion: Severe ______ Moderate X Minor ______

Describe: raw areas, scour

Silt Deposition: moderate

Pollutants (observation / potential sources): sewage - smell, road runoff

Stormwater Outfalls: Ø

Riparian Zone:
Development: Park on L Bank - Road on R

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: T.p., red maple, greenbrier

Approximate % shading by woody species: 50%

Steepness of adjacent slopes: 1-5%

Notes: ______

Stream Features
Field Sheet

Date: 7-10-07 Project Site: Purple Line Wetland # : 004

Observer(s): BG, HS, KR

Stream Flow:
Perennial: X Intermittent ______ Ephemeral ______

Gradient: 1% Classification: R3UB1/2

Approximate Drainage Basin: ______

Morphology:
Avg. Channel Width 20' Depth 6' Avg. Water Depth 6"

Has stream morphometry been altered? yes Describe type and degree:
channelized at culvert, banks stabilized w/rip rap

Habitat and Pollutants:
Substrate (predominant type (s)): gravel/sand

Habitat Complexity (Characterize) low to moderate - few undercut banks

Bank Erosion: Severe ______ Moderate ______ Minor X

Describe: Currently being stabilized

Silt Deposition: moderate

Pollutants (observation / potential sources): sewage, road runoff

Stormwater Outfalls: 2

Riparian Zone:
Development: L Forest R Road

Riparian vegetation: Forest ✓ Shrubs ✓ Herbs —

Dominant Species: sycamore, t.p., highbush blueberry, honeysuckle

Approximate % shading by woody species: 90%

Steepness of adjacent slopes: L 1-5% R road embankment

Notes: ______

Stream Features
Field Sheet

Date: 7-10-07 Project Site: Purple Line Wetland # : 005

Observer(s): BG, HS, KR

Stream Flow:
Perennial: X Intermittent ______ Ephemeral ______

Gradient: 1% Classification: R3UB1/2

Approximate Drainage Basin: ______

Morphology:
Avg. Channel Width 15' Depth 5' Avg. Water Depth 2"

Has stream morphometry been altered? yes Describe type and degree:
channelized at culvert w/ gabions

Habitat and Pollutants:
Substrate (predominant type (s)): gravel/sand

Habitat Complexity (Characterize) low - large amounts of trash present in stream

Bank Erosion: Severe X Moderate X Minor ______

Describe: upstream areas w/ large amounts of scour

Silt Deposition: heavy

Pollutants (observation / potential sources): high % of trash
Shopping carts, newspaper, human feces

Stormwater Outfalls: Ø

Riparian Zone:
Development: (L) - apartments (R) Rec. area / apartments

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: Japanese Knotweed, Sycamore, Euonymous

Approximate % shading by woody species: 75%

Steepness of adjacent slopes: 1-20%

Notes: vertical banks on (L)

NW Branch

Stream Features
Field Sheet

Date: 7-10-07 Project Site: Purple Line Wetland # : 006

Observer(s): BG, HS, KR

Stream Flow:
Perennial: X Intermittent ______ Ephemeral ______

Gradient: <1% Classification: R2UB2

Approximate Drainage Basin: ______

Morphology:
Avg. Channel Width 25' Depth 5' Avg. Water Depth 6"

Has stream morphometry been altered? yes Describe type and degree:
Channelized near culvert

Habitat and Pollutants:
Substrate (predominant type (s)): Sand

Habitat Complexity (Characterize) low to mod. - few deep pools, no clean riffles

Bank Erosion: Severe ______ Moderate ______ Minor X

Describe: unvegetated areas

Silt Deposition: heavy near culvert

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: 1 pipe

Riparian Zone:
Development: Fields on both sides, narrow buffer

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: multiflora rose, foxtail, willow sycamore

Approximate % shading by woody species: 40%

Steepness of adjacent slopes: 1%

Notes: ______

trib to NW Branch

Stream Features
Field Sheet

Date: 7-12-07 Project Site: Purple Line Wetland # : 007

Observer(s): BG, MRS, AT

Stream Flow:

Perennial: X Intermittent ______ Ephemeral ______

Gradient: <1% Classification: R2UB2

Approximate Drainage Basin: ______

Morphology:

Avg. Channel Width 5.5' Depth 4' Avg. Water Depth 2.5'

Has stream morphometry been altered? Yes Describe type and degree:

channelized its entire length due to culvert

Habitat and Pollutants:

Substrate (predominant type (s)): Sand

Habitat Complexity (Characterize) low - lack of deep pools, no clean riffles

Bank Erosion: Severe ______ Moderate X Minor ______

Describe: erosion concentrated below pipe

Silt Deposition: heavy

Pollutants (observation / potential sources): roadside runoff

Stormwater Outfalls: none

Riparian Zone:

Development: L Bank - archery R MD193 - narrow riparian buffer

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: ironwood, t.p., red maple, box elder, poison ivy, Japanese brome

Approximate % shading by woody species: 95%

Steepness of adjacent slopes: <1%

Notes:

Stream Features
Field Sheet

Date: 7-12-07 Project Site: Purple Line Wetland #: 008

Observer(s): BG, MS, AT

Stream Flow:

Perennial: ______ Intermittent X Ephemeral ______

Gradient: ______ Classification: R4SB2

Approximate Drainage Basin: ______

Morphology:

Avg. Channel Width 3.5 Depth 3' Avg. Water Depth 2"

Has stream morphometry been altered? yes Describe type and degree:

channelized to culvert

Habitat and Pollutants:

Substrate (predominant type (s)): Sand

Habitat Complexity (Characterize) low - due to shallow flows

Bank Erosion: Severe X Moderate ______ Minor ______

Describe: in lower portions

Silt Deposition: moderate

Pollutants (observation / potential sources): trash - road runoff

Stormwater Outfalls: none

Riparian Zone:

Development: L MD 193 R Cricket Course

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: green ash, princess tree,

Approximate % shading by woody species: 90%

Steepness of adjacent slopes: 1%

Notes:

Stream Features
Field Sheet

Date: 7-12-07 Project Site: Purple Line Wetland #: 009

Observer(s): BG, MR, AT

Stream Flow:
Perennial: ______ Intermittent X Ephemeral ______

Gradient: 1% Classification: R4SB1/2

Approximate Drainage Basin: ______

Morphology:
Avg. Channel Width 2' Depth 2' Avg. Water Depth no water present

Has stream morphometry been altered? yes Describe type and degree:
channelized and rip-rap at top

Habitat and Pollutants:
Substrate (predominant type (s)): gravel / sand

Habitat Complexity (Characterize) low

Bank Erosion: Severe ______ Moderate ______ Minor X

Describe: ______

Silt Deposition: minor

Pollutants (observation / potential sources): pond effluent

Stormwater Outfalls: none.

Riparian Zone:
Development: R Cricket Course, L trib

Riparian vegetation: Forest X Shrubs X Herbs Y

Dominant Species: black walnut, sycamore, Japanese brome

Approximate % shading by woody species: 95%

Steepness of adjacent slopes: 1%

Notes: ______

W010
SWM. area

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Purple Line
Applicant/Owner: MTA
Investigator: BG, MR, AT

Date: 7-12-07
County: PG
State: MD

Do Normal Circumstances exist on the site? Yes No
Is the site significantly disturbed (Atypical Situation)? Yes No
Is the area a potential Problem Area? Yes No
(If needed, explain on reverse.)

Community ID: PEM1/2E
Transect ID:
Plot ID: TP10-1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Juncus effusus	H	FACW+	9.		
2. Scirpus cyperinus	H	FACW+	10.		
3. Solidago sp.	H		11.		
4. Juncus tenuis	H	FAC-	12.		
5. Eleocharis obtusis	H	OBL	13.		
6. Carex lurida	H	OBL	14.		
7. Ludwigia palustris	H	OBL	15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 86%

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
✓ No Recorded Data Available

Field Observations:

Depth of Surface Water: — (in.)
Depth to Free Water in Pit: — (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
✓ Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
✓ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: 2" water present within 2% of plot

SOILS

Map Unit Name
(Series and Phase): ______ Drainage Class: ______
Taxonomy (Subgroup): ______ Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-2	A	10YR4/2	—	—	Cl
2-4		5Y7/1	10YR5/6	C, P	scl
4+		10YR7/1	7.5YR5/8	C, P	scl

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes No (Circle)	
Wetland Hydrology Present?	Yes No	(Circle)
Hydric Soils Present?	Yes No	Is this Sampling Point Within a Wetland? Yes No

Remarks:

Stream Features
Field Sheet

Date: 7-12-07 Project Site: Purple Line Wetland #: 011

Observer(s): BG, MR, AT

Stream Flow:

Perennial: ________ Intermittent X Ephemeral ________

Gradient: 1% Classification: R4SB2 / X - rip rap

Approximate Drainage Basin: ________

Morphology:

Avg. Channel Width 3' Depth 1' Avg. Water Depth 1"

Has stream morphometry been altered? yes Describe type and degree:

- the control structure has altered slope w/in stream causing drainage divide - section of stream not flagged

Habitat and Pollutants:

Substrate (predominant type (s)): sand / rip rap

Habitat Complexity (Characterize) very low

Bank Erosion: Severe ________ Moderate ________ Minor X

Describe: –

Silt Deposition: minor

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: none

Riparian Zone:

Development: maintained green space

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: sweet gums >30", pi., japanese hops, weeping willow

Approximate % shading by woody species: 50%

Steepness of adjacent slopes: 1%

Notes: ________

tributary to Paint Branch

Stream Features
Field Sheet

Date: 7-16-07 **Project Site:** Purple Line **Wetland # :** 012

Observer(s): BE, HS, AT

Stream Flow:
Perennial: ✓ **Intermittent** ______ **Ephemeral** ______

Gradient: 1% upper reach >1% lower **Classification:** R2UB1/2X (riprap)

Approximate Drainage Basin: ______

Morphology:
Avg. Channel Width upper - 4' 10' **Depth** upper - 2' 2.5' **Avg. Water Depth** 2"

Has stream morphometry been altered? Yes **Describe type and degree:**
channelized along road

Habitat and Pollutants:
Substrate (predominant type (s)): gravel /sand rip-rap

Habitat Complexity (Characterize) moderate - deep pools, few undercut banks - minnows observed

Bank Erosion: **Severe** ______ **Moderate** X **Minor** ______

Describe: rip-rap stabilization evident

Silt Deposition: moderate

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: 3

Riparian Zone:
Development: L Bank - Paint Branch Pkwy R - forested

Riparian vegetation: **Forest** ✓ **Shrubs** ✓ **Herbs** ✓

Dominant Species: sycamore, green ash, box elder, silver maple spicebush, violet, swamp smartweed

Approximate % shading by woody species: 95%

Steepness of adjacent slopes: 1 - 20% (road embankment)

Notes: ______

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Purple Line
Applicant/Owner: MTA
Investigator: BG, HS, AT

Date: 7/16/07
County: PG
State: MD

Do Normal Circumstances exist on the site? Yes No — Yes
Is the site significantly disturbed (Atypical Situation)? Yes No — No
Is the area a potential Problem Area? Yes No — No
(If needed, explain on reverse.)

Community ID: PFO1C
Transect ID: W013
Plot ID: TP-013

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Platanus occidentalis	T	FACW-
2. Betula nigra	T	FACW
3. Boehmeria cylindrica	H	FACW+
4. Lindera benzoin	S	FACW-
5. Impatiens capensis	H	FACW
6. Polygonum perfoliatum	H	FAC*
7. Rosa multiflora		FACU
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 86%

Remarks: visual estimate of dominance

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
✓ No Recorded Data Available

Field Observations:

Depth of Surface Water: — (in.)
Depth to Free Water in Pit: 8 (in.)
Depth to Saturated Soil: 8 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
✓ Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
✓ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: wetland swale between intermittent stream & perennial stream

SOILS

Map Unit Name (Series and Phase): Ha Hatboro silt loam

Drainage Class: poorly drained

Taxonomy (Subgroup): Cumulic Normaquepts

Field Observations Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4		10YR2/1	—	—	sil
4-8		2.5Y5/3	10YR5/8	M/D	sl
8+		10YR3/2	10YR5/8	F/F	fine scl

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes No (Circle)	
Wetland Hydrology Present?	Yes No	(Circle)
Hydric Soils Present?	Yes No	Is this Sampling Point Within a Wetland? Yes No

Remarks:

Approved by HQUSACE 2/92

W013

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Purple Line	Date: 7-16-07
Applicant/Owner: MTA	County: PG
Investigator: BG, HS, AT	State: MD
Do Normal Circumstances exist on the site? Yes No (Yes circled)	Community ID: PEM2E
Is the site significantly disturbed (Atypical Situation)? Yes No (No circled)	Transect ID:
Is the area a potential Problem Area? Yes No (No circled)	Plot ID: TP13-1
(If needed, explain on reverse.)	

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Carex crinita	H	OBL	9.		
2. Boehmeria cylindrica	H	FACW+	10.		
3. Scirpus atrovirens	H	OBL	11.		
4. Carex scoparia	H	FACW	12.		
5. Polygonum sagittatum	H	OBL	13.		
6. Carex stipata	H	OBL	14.		
7. Polygonum hydropiper	H	OBL	15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: — (in.)

Depth to Free Water in Pit: 10 (in.)

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ✓ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ✓ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Emergent Wetland bench

SOILS

Map Unit Name Ha
(Series and Phase): Hatboro silt loam

Taxonomy (Subgroup): Cumulic Normaquepts

Drainage Class: poorly drained
Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-5		10YR3/2	10YR4/6	F,F	SiCl
5-10		10YR3/1	10YR3/6	C,F	SiCl
10-12		10YR4/2	10YR3/6	F,F	SCl
12+		2.5Y4/2	2.5Y5/6	F,F	Sl

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No (Circle)
Wetland Hydrology Present? Yes No
Hydric Soils Present? Yes No

(Circle)
Is this Sampling Point Within a Wetland? Yes No

Remarks:

Stream Features
Field Sheet

Date: 7-16-07 Project Site: Purple Line Wetland # : 014

Observer(s): BG, HS, AT

Stream Flow:

Perennial: X Intermittent ______ Ephemeral ______

Gradient: <1% Classification: R2UB2

Approximate Drainage Basin: ______

Morphology:

Avg. Channel Width 3' Depth 1' Avg. Water Depth 1"

Has stream morphometry been altered? yes Describe type and degree:

channelized to confluence

Habitat and Pollutants:

Substrate (predominant type (s)): sand

Habitat Complexity (Characterize) very low - deep pool at bottom of pipe

Bank Erosion: Severe ______ Moderate ______ Minor X

Describe: —

Silt Deposition: heavy

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: Ø

Riparian Zone:

Development: none

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: sycamore, spicebush, green ash, phragmites

Approximate % shading by woody species: 98%

Steepness of adjacent slopes: <1%

Notes: ______

Stream Features
Field Sheet

Date: 7-16-07 Project Site: Purple Line Wetland #: 015

Observer(s): BG, HS, AT

Stream Flow:
Perennial: X Intermittent ______ Ephemeral ______

Gradient: <1% Classification: R2UBX

Approximate Drainage Basin: ______

Morphology:
Avg. Channel Width 5' Depth 1' Avg. Water Depth 2"

Has stream morphometry been altered? Yes Describe type and degree:
Channelized to confluence

Habitat and Pollutants:
Substrate (predominant type (s)): rip-rap

Habitat Complexity (Characterize) low - short distance to confluence

Bank Erosion: Severe ______ Moderate ______ Minor X

Describe: —

Silt Deposition: minor

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: Ø

Riparian Zone:
Development: disturbed due to roadway maintenance

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: Princess tree, Norway maple, Rubus sp

Approximate % shading by woody species: 95%

Steepness of adjacent slopes: 1- 5%

Notes: ______

Stream Features
Field Sheet

Date: 7-16-07 Project Site: Purple Line Wetland #: 16

Observer(s): BG, HS, AT

Stream Flow:
Perennial: ______ Intermittent ✓ Ephemeral ______

Gradient: <1% Classification: R4SB1/2

Approximate Drainage Basin: ______

Morphology:
Avg. Channel Width 5' Depth 2' Avg. Water Depth no water present

Has stream morphometry been altered? Yes Describe type and degree:
Channelized ditch

Habitat and Pollutants:
Substrate (predominant type (s)): gravel / sand

Habitat Complexity (Characterize) low due to shallow flows

Bank Erosion: Severe ______ Moderate ______ Minor X

Describe: –

Silt Deposition: moderate

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: None

Riparian Zone:
Development: none

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: Black willow, elm, red maple

Approximate % shading by woody species: 80%

Steepness of adjacent slopes: 1%

Notes: ______

W17

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Purple Line
Applicant/Owner: MTA
Investigator: BG, HS, AT

Date: 7-16-07
County: PG
State: MD

Do Normal Circumstances exist on the site? **Yes** No
Is the site significantly disturbed (Atypical Situation)? Yes **No**
Is the area a potential Problem Area? Yes **No**
(If needed, explain on reverse.)

Community ID: PSS1E
Transect ID:
Plot ID: TP-171

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Sagittaria sp	H		9.		
2. Salix nigra	S	FACW+	10.		
3. Elm	S		11.		
4. Eupatorium sp.	H		12.		
5. Boehmeria cylindrica	H	FACW+	13.		
6. Polygonum pennsylvanica	H	FACW	14.		
7. Carex sp.	H		15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: — (in.)
Depth to Free Water in Pit: — (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
✓ Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
✓ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
___ Oxidized Root Channels in Upper 12 Inches
✓ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks:
within channel due to grading issues and incorrect placement of rip-rap

SOILS

Map Unit Name BIA
(Series and Phase): Beltsville silt loam, 0-2% slopes

Drainage Class: Moderately well drained
Field Observations
Confirm Mapped Type? Yes No

Taxonomy (Subgroup): Typic Fragiudults

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-2		Organics			
2+		10YR 3/1	—	—	SL

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No (Circle)
Wetland Hydrology Present? Yes No
Hydric Soils Present? Yes No

(Circle)
Is this Sampling Point Within a Wetland? Yes No

Remarks:

Stream Features
Field Sheet

Date: 7/6/07 Project Site: Purple Line Wetland #: 18

Observer(s): BG, HS, AT

Stream Flow:
Perennial: X Intermittent ______ Ephemeral ______

Gradient: <1% Classification: R2UB 1/2

Approximate Drainage Basin: ______

Morphology:
Avg. Channel Width 55' Depth 7' Avg. Water Depth 12"

Has stream morphometry been altered? YES Describe type and degree:
Channelized, weir

Habitat and Pollutants:
Substrate (predominant type (s)): gravel / sand

Habitat Complexity (Characterize) moderate - nice riffle through weir - not alot of cover

Bank Erosion: Severe ______ Moderate ______ Minor X

Describe: —

Silt Deposition: moderate

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: 1

Riparian Zone:
Development: L Bank - trail R bank - overgrown field

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: Poison Ivy, Sycamore, red maple, deertongue witchgrass

Approximate % shading by woody species: 4%

Steepness of adjacent slopes: 1%

Notes: ______

W019.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Purple Line
Applicant/Owner: MTA
Investigator: DA, HS, AT

Date: 7-17-07
County: PG
State: MD

Do Normal Circumstances exist on the site? **Yes** No
Is the site significantly disturbed (Atypical Situation)? Yes **No**
Is the area a potential Problem Area? Yes **No**
(If needed, explain on reverse.)

Community ID: POW w/PEM 1/2H
Transect ID:
Plot ID:

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Typha latifolia	H	OBL	9.		
2. Juncus effusus	H	FACW+	10.		
3. Sagittaria latifolia	H	OBL	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks: 5' wide PEM fringe

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: unknown depth (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
✓ Inundated
✓ Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series and Phase): Ha Hatboro silt loam

Drainage Class: poorly drained

Taxonomy (Subgroup): Cumulic Normaquepts

Field Observations Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Soils not taken due to inundation

WETLAND DETERMINATION

Hydrophytic Vegetation Present? ~~Yes~~ No (Circle)
Wetland Hydrology Present? Yes No
Hydric Soils Present? ~~Yes~~ No

(Circle)
Is this Sampling Point Within a Wetland? Yes No

Remarks:

Stream Features
Field Sheet

Date: 7-17- Project Site: Purple Line Wetland #: 020

Observer(s): BG, HS, AT

Stream Flow:
Perennial: X Intermittent ___ Ephemeral ___

Gradient: < 1% Classification: R2UB3

Approximate Drainage Basin: ___

Morphology:
Avg. Channel Width 6.5' Depth 1' Avg. Water Depth 4"

Has stream morphometry been altered? yes Describe type and degree:
channelized

Habitat and Pollutants:
Substrate (predominant type (s)): mud

Habitat Complexity (Characterize) low - no flow - heavy sedimentation

Bank Erosion: Severe ___ Moderate ___ Minor X

Describe: –

Silt Deposition: heavy

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: none

Riparian Zone:
Development: R Bank - Ball field L Bank

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: Black cherry, red maple, multiflora rose, Japanese honeysuckle, fowl manna grass

Approximate % shading by woody species: 95%

Steepness of adjacent slopes: 1%

Notes:

W021

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Purple Line	Date: 7-16-07
Applicant/Owner: MTA	County: PG
Investigator: BG, HS, AT	State: MD
Do Normal Circumstances exist on the site? Yes No	Community ID: PFO1A
Is the site significantly disturbed (Atypical Situation)? Yes No	Transect ID:
Is the area a potential Problem Area? Yes No (If needed, explain on reverse.)	Plot ID: TP021-1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Acer rubrum	T	FAC	9.		
2. Rosa multiflora	S	FAC U	10.		
3. Lonicera japonica	S	FAC-	11.		
4. Boehmeria cylindrica	H	FACW+	12.		
5. Glyceria striata	H	OBL	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 60%

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water: — (in.)

Depth to Free Water in Pit: — (in.)

Depth to Saturated Soil: 6 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ✓ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: possible beaver dam

SOILS

Map Unit Name (Series and Phase): Ha Hatboro silt loam

Drainage Class: poorly drained

Field Observations Confirm Mapped Type? Yes No

Taxonomy (Subgroup): Cumulic Normaquepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-2	A	10YR3/2	10YR4/6	C, F	C
2-4		10YR4/1	7.5YR 4/6.4	M, D	C w/ rootlets
4+		10YR4/1	7.5YR4/6	C, D	C w/ course gravel

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No (Circle)

Wetland Hydrology Present? Yes No

Hydric Soils Present? Yes No

(Circle)

Is this Sampling Point Within a Wetland? Yes No

Remarks:

NE Branch

Stream Features
Field Sheet

Date: 7-18-07 **Project Site:** Purple Line **Wetland #:** 022

Observer(s): BG, AT, MB

Stream Flow:
Perennial: X **Intermittent** ______ **Ephemeral** ______

Gradient: <1% **Classification:** R2UB1/2

Approximate Drainage Basin: ______

Morphology:
Avg. Channel Width 60' **Depth** 8' **Avg. Water Depth** 12"

Has stream morphometry been altered? Yes **Describe type and degree:**
Channelized to bridge - rip-rap

Habitat and Pollutants:
Substrate (predominant type (s)): gravel/sand

Habitat Complexity (Characterize) moderate - few riffle, some cover for fish

Bank Erosion: **Severe** ______ **Moderate** ______ **Minor** X

Describe: —

Silt Deposition: moderate

Pollutants (observation / potential sources): road runoff, sewage

Stormwater Outfalls: one

Riparian Zone:
Development: L Bank - Park R Bank - residential

Riparian vegetation: **Forest** X **Shrubs** X **Herbs** X

Dominant Species: catalpa, riverbirch, sycamore, poisonivy, multiflora, Japanese brome, VA creeper

Approximate % shading by woody species: 15%

Steepness of adjacent slopes: 1%

Notes: ______

Stream Features
Field Sheet

Date: 7-18-07 **Project Site:** Purple Line **Wetland #:** 023

Observer(s): BG, AT, MB

Stream Flow:

Perennial: ________ **Intermittent** X **Ephemeral** ________

Gradient: 1% **Classification:** R4SB1/2

Approximate Drainage Basin: ________

Morphology:

Avg. Channel Width 3' **Depth** 2' **Avg. Water Depth** no water

Has stream morphometry been altered? yes **Describe type and degree:**
rip-rap placed in channel

Habitat and Pollutants:

Substrate (predominant type (s)): gravel/sand

Habitat Complexity (Characterize) very low due to shallow flows

Bank Erosion: **Severe** ________ **Moderate** ________ **Minor** X

Describe: —

Silt Deposition: minor

Pollutants (observation / potential sources): road runoff, trash

Stormwater Outfalls: none

Riparian Zone:

Development: (L) Bank 295 (R) bank swm pond

Riparian vegetation: **Forest** X **Shrubs** X **Herbs** X

Dominant Species: Red maple, elm, silver maple, catalpa, poison ivy, multiflora rose

Approximate % shading by woody species: 95%

Steepness of adjacent slopes: ________

Notes: ________

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Purple Line
Applicant/Owner: MTA
Investigator: BG, AT, MB

Date: 7-18-07
County: PG
State: MD

Do Normal Circumstances exist on the site? Yes **No**
Is the site significantly disturbed (Atypical Situation)? **Yes** No
Is the area a potential Problem Area? Yes **No**
(If needed, explain on reverse.)

Community ID: PEM1/2H
Transect ID:
Plot ID: TP24-1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Typha latifolia	H	OBL	9.		
2. Lemna minor	H	OBL	10.		
3. Limnobium spongia	H	OBL	11.		
4. Juncus effusus	H	FACW+	12.		
5. Leersia oryzoides	H	OBL	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
✓ No Recorded Data Available

Field Observations:

Depth of Surface Water: <1 (in.)

Depth to Free Water in Pit: 10 (in.)

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
✓ Inundated
✓ Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
✓ Oxidized Root Channels in Upper 12 Inches
✓ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: SWM pond that may overflow into adjacent stream

SOILS

Map Unit Name SWC
(Series and Phase): Sunnyside - Urban land complex, 5-10% slopes

Drainage Class: well-drained

Taxonomy (Subgroup): Typic Normudults

Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 - 2		Organic	Mat		
	Fill	to 12+"	Redox	present	SC
			5YR4/6	m	
			7.5YR4/6		

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ✓ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No (Circle)
Wetland Hydrology Present? Yes No
Hydric Soils Present? Yes No

(Circle)
Is this Sampling Point Within a Wetland? Yes No

Remarks:

Approved by HQUSACE 2/92

WD25

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Purple Line Applicant/Owner: WMTA Investigator: BG, AT, MB	Date: 7-18-07 County: PG State: MD
Do Normal Circumstances exist on the site? Yes **No** Is the site significantly disturbed (Atypical Situation)? **Yes** No Is the area a potential Problem Area? Yes **No** (If needed, explain on reverse.)	Community ID: POW w/ PSS 1H Transect ID: Plot ID:

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Salix nigra	S	FACW+	9.		
2. Cephalanthus occidentalis	S	OBL	10.		
3. Sagittaria latifolia	H	OBL	11.		
4. Juncus effusus	H	FACW+	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks:

HYDROLOGY

__ Recorded Data (Describe in Remarks): __ Stream, Lake, or Tide Gauge __ Aerial Photographs __ Other ✓ No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: ✓ Inundated ✓ Saturated in Upper 12 Inches ✓ Water Marks __ Drift Lines __ Sediment Deposits __ Drainage Patterns in Wetlands Secondary Indicators (2 or more required): __ Oxidized Root Channels in Upper 12 Inches __ Water-Stained Leaves __ Local Soil Survey Data __ FAC-Neutral Test __ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: unknown (in.) Depth to Free Water in Pit: — (in.) Depth to Saturated Soil: 0 (in.)	

Remarks: SWM pond w PSS fringe

SOILS

Map Unit Name StE
(Series and Phase): Sunnyside fine sandy loam 15-30% slopes

Drainage Class: well drained

Taxonomy (Subgroup): Typic Normudults

Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Soils not taken due to flooded condition

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No (Circle)
Wetland Hydrology Present? Yes No
Hydric Soils Present? Yes No

(Circle)
Is this Sampling Point Within a Wetland? Yes No

Remarks:

Stream Features
Field Sheet

Date: 7-18-07 Project Site: Purple Line Wetland #: WVS026

Observer(s): BG, AT, MB

Stream Flow:

Perennial: ______ Intermittent X Ephemeral ______

Gradient: 1% Classification: R4SBX

Approximate Drainage Basin: ______

Morphology:

Avg. Channel Width 3' Depth 2' Avg. Water Depth no water

Has stream morphometry been altered? yes Describe type and degree:

channelized its entire length - no natural substrate

Habitat and Pollutants:

Substrate (predominant type (s)): rip-rap

Habitat Complexity (Characterize) low

Bank Erosion: Severe ______ Moderate ______ Minor X

Describe: —

Silt Deposition: minor

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: none

Riparian Zone:

Development: L Bank - overgrown field R Bank residential

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: Black locust, Black willow, sassafras, pickerelweed, sagittaria

Approximate % shading by woody species: 35%

Steepness of adjacent slopes: 1-5%

Notes: ______

W26

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Purple Line Applicant/Owner: MTA Investigator: BO, AT, MB	Date: 7-18-07 County: PG State: MD
Do Normal Circumstances exist on the site? Yes **No** Is the site significantly disturbed (Atypical Situation)? **Yes** No Is the area a potential Problem Area? Yes **No** (If needed, explain on reverse.)	Community ID: PEM2A Transect ID: ____ Plot ID: ____

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Impatiens capensis	H	FACW	9.		
2. Sagittaria latifolia	H	OBL	10.		
3. Cicuta maculata	H	OBL	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

✓ No Recorded Data Available

Field Observations:

Depth of Surface Water: — (in.)

Depth to Free Water in Pit: — (in.)

Depth to Saturated Soil: — (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ✓ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ✓ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: located w/in stream channel

SOILS

Map Unit Name S+E
(Series and Phase): Sunnyside fine sandy loam 15-30% slopes
Drainage Class: well-drained
Taxonomy (Subgroup): Typic Normudults
Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

no soils taken due to rip-rap substrate

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No (Circle)
Wetland Hydrology Present? Yes No
Hydric Soils Present? Yes No

(Circle)
Is this Sampling Point Within a Wetland? Yes No

Remarks:

Stream Features
Field Sheet

Date: 7-18-07 Project Site: Purple Line Wetland # : 027

Observer(s): BO, AT/MB

Stream Flow:
Perennial: X Intermittent X Ephemeral ____

Gradient: 1% Classification: R2/R4 UB 1/2

Approximate Drainage Basin: ____

Morphology:
Avg. Channel Width 5' Depth 2.5' Avg. Water Depth dry for most parts, 1" in ponded areas

Has stream morphometry been altered? yes Describe type and degree:
Channelized along MD 410

Habitat and Pollutants:
Substrate (predominant type (s)): gravel/Sand

Habitat Complexity (Characterize) low - due to low flows

Bank Erosion: Severe ____ Moderate X Minor ____

Describe: undercut banks

Silt Deposition: moderate

Pollutants (observation / potential sources): road runoff, trash

Stormwater Outfalls: 2

Riparian Zone:
Development: L Bank - Forested R Bank - MD 410

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: Sweet gum, tulip poplar, multiflora rose, poison ivy

Approximate % shading by woody species: 95%

Steepness of adjacent slopes: 1-5%

Notes: ____

Stream Features
Field Sheet

Date: 7-18-07 Project Site: Purple Line Wetland #: WUS028

Observer(s): BG, AT, MB

Stream Flow:
Perennial: ________ Intermittent X Ephemeral ________

Gradient: 1% Classification: R4SB2

Approximate Drainage Basin: ________

Morphology:
Avg. Channel Width 6' Depth 4' Avg. Water Depth dry in most areas <1"

Has stream morphometry been altered? No Describe type and degree:

very sinous

Habitat and Pollutants:
Substrate (predominant type (s)): sand

Habitat Complexity (Characterize) low due to no flow sor shallow flows

Bank Erosion: Severe X Moderate ________ Minor ________

Describe: raw areas along banks

Silt Deposition: heavy

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: none.

Riparian Zone:
Development: ________

Riparian vegetation: Forest ________ Shrubs / Herbs ________

Dominant Species: Black gum, tulip poplar, sweet gum, poison ivy, greenbrier, arrow-wood

Approximate % shading by woody species: 98%

Steepness of adjacent slopes: 1-5%

Notes: ________

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: PurpleLine	**Date:** 7/31/07
Applicant/Owner: MTA	**County:** PG
Investigator: BG HS, AT	**State:** MD
Do Normal Circumstances exist on the site? Yes	**Community ID:** PEM1E / PSS
Is the site significantly disturbed (Atypical Situation)? No	**Transect ID:** W029
Is the area a potential Problem Area? No (If needed, explain on reverse.)	**Plot ID:** TP-29

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Juncus effusus	H	FACW+	9. Lespedeza sp.	H	
2. Impatiens capensis	H	FACW	10.		
3. Carex lurida	H	OBL	11. PSS Portion		
4. Leersia oryzoides	H	OBL	12. Sambucus nigra canadensis	S	FACW-
5. Polygonum sagittatum	H	OBL	13. Eupatoriadelphus maculatus	H	FACW
6. Eupatorium serotinum	H	FAC-	14. Phalaris arundinacea	H	FACW+
7. Dichanthelium clandestinum	H	FACW+	15. Salix nigra	S	FACW+
8. Ambrosia trifida	H	FAC	16. Ludwigia palustris	H	OBL

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). PEM → 88% PSS → 100%

Remarks: Visual estimate of dominance / Narrow, PSS portion allow stream channel

HYDROLOGY

___ **Recorded Data (Describe in Remarks):**
- ___ **Stream, Lake, or Tide Gauge**
- ___ **Aerial Photographs**
- ___ **Other**

___ **No Recorded Data Available**

Field Observations:

Depth of Surface Water: ___ **(in.)**

Depth to Free Water in Pit: ___ **(in.)**

Depth to Saturated Soil: 4 **(in.)**

Wetland Hydrology Indicators:

Primary Indicators:
- ___ **Inundated**
- ✓ **Saturated in Upper 12 Inches**
- ___ **Water Marks**
- ___ **Drift Lines**
- ___ **Sediment Deposits**
- ___ **Drainage Patterns in Wetlands**

Secondary Indicators (2 or more required):
- ✓ **Oxidized Root Channels in Upper 12 Inches**
- ___ **Water-Stained Leaves**
- ___ **Local Soil Survey Data**
- ___ **FAC-Neutral Test**
- ___ **Other (Explain in Remarks)**

Remarks: Floodplain wetland system — very old (could be mitigation site) beaver activity observed.

SOILS

Map Unit Name
(Series and Phase): Bo Bibb silt loam

Drainage Class: Poor

Taxonomy (Subgroup): Cumulic Normaquents

Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-10		10YR4/2	7.5YR4/6	M/D	sicl
10+		10YR4/2	5YR4/6	M/P	scl

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes No (Circle)	
Wetland Hydrology Present?	Yes No	(Circle)
Hydric Soils Present?	Yes No	Is this Sampling Point Within a Wetland? Yes No

Remarks:

Stream Features
Field Sheet

Date: 7/31/07 **Project Site:** Purple Line **Wetland #:** WUS030

Observer(s): BG, HS, AT

Stream Flow:
Perennial: ✓ **Intermittent** ____ **Ephemeral** ____

Gradient: 2% **Classification:** R4SBx - rip-rap.

Approximate Drainage Basin: ____

Morphology:
Avg. Channel Width 4' **Depth** 1' **Avg. Water Depth** no water

Has stream morphometry been altered? Yes **Describe type and degree:**
straightened filled w/ rip-rap

Habitat and Pollutants:
Substrate (predominant type (s)): rip-rap &, some sand.
Habitat Complexity (Characterize) low, rip-rap, low flows.

Bank Erosion: **Severe** ____ **Moderate** ____ **Minor** ✓

Describe: rip rap.

Silt Deposition: Minor

Pollutants (observation / potential sources): road runoff.

Stormwater Outfalls: —

Riparian Zone:
Development: forested.

Riparian vegetation: **Forest** ____ **Shrubs** ____ **Herbs** ____

Dominant Species: red maple, tulip poplar, black locust, willow

Approximate % shading by woody species: 30%

Steepness of adjacent slopes: 0-5%

Notes: questionable - could be ephemeral channel completely dry during field review.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Purple Line Applicant/Owner: MTA Investigator: BG, HS, AT	Date: 7/31/07 County: PG State: MD
Do Normal Circumstances Exist on the site? **Yes** No Is the site significantly disturbed (Atypical Situation)? **Yes** ~~No~~ Is the area a potential Problem Area? Yes **No** (If needed, explain on reverse.)	Community ID: PEM1A Transect ID: W031 Plot ID: TP-31

soils are disturbed - not hydric

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Typha latifolia	H	OBL	9. Solidago sp		
2. Ludwigia palustris	H	OBL	10. Carex vulpinoidea		OBL
3. Dichanthelium clandestinum	H	FACW+	11.		
4. Carex lurida	H	OBL	12.		
5. Juncus effusus	H	FACW+	13.		
6. Eupatorium perfoliatum	H	FACW+	14.		
7. Glyceria striata	H	OBL	15.		
8. Scirpus atrovirens		OBL	16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks: visual estimate of dominance

HYDROLOGY

___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ___ Aerial Photographs ___ Other ✓ No Recorded Data Available	Wetland hydrology Indicators: Primary Indicators: ___ Inundated ✓ Saturated in Upper 12 Inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits ___ Drainage Patterns in Wetlands Secondary Indicators (2 or more required): ___ Oxidized Root Channels in Upper 12" ___ Water-Stained Leaves ___ Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: — (in.) Depth to Free Water in Pit: — (in.) Depth to Saturated Soil: 8 (in.)	

Remarks: base of a culvert, several ephemeral channels flow into it — stream channel that wetland is on is questionable — possibly ephemeral & not RU

SOILS

Map Unit Name (Series and Phase): StE Sunnyside fine sandy loam

Drainage Class: Well

Field Observations Confirm Mapped Type? Yes No

Taxonomy (Subgroup): Typic Normudults

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6r.		10YR4/3	2.5YR4/6	C/D	scl

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Soils disturbed & sitting on top of rip-rap.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No	(Circle)
Wetland Hydrology Present?	Yes	No	
Hydric Soils Present?	Yes	No	

Is this Sampling Point Within a Wetland? (Circle) Yes No

Remarks: questionable area - disturbed

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Purple Line Applicant/Owner: MTA Investigator: BG, HS, AT	Date: 7/31/07 County: PG State: MD
Do Normal Circumstances Exist on the site? **Yes** No Is the site significantly disturbed (Atypical Situation)? **Yes** ~~No~~ Is the area a potential Problem Area? Yes **No** (If needed, explain on reverse.)	Community ID: PEM1A Transect ID: W031 Plot ID: TP-31

soils are disturbed - not hydric

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Typha latifolia	H	OBL	9. Solidago sp		
2. Ludwigia palustris	H	OBL	10. Carex vulpinoidea		OBL
3. Dichanthelium clandestinum	H	FACW+	11.		
4. Carex lurida	H	OBL	12.		
5. Juncus effusus	H	FACW+	13.		
6. Eupatorium perfoliatum	H	FACW+	14.		
7. Glyceria striata	H	OBL	15.		
8. Scirpus atrovirens		OBL	16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks: visual estimate of dominance.

HYDROLOGY

___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ___ Aerial Photographs ___ Other ✓ No Recorded Data Available	Wetland hydrology Indicators: Primary Indicators: ___ Inundated ✓ Saturated in Upper 12 Inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits ___ Drainage Patterns in Wetlands
Field Observations: Depth of Surface Water: — (in.) Depth to Free Water in Pit: — (in.) Depth to Saturated Soil: 8 (in.)	Secondary Indicators (2 or more required): ___ Oxidized Root Channels in Upper 12" ___ Water-Stained Leaves ___ Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)

Remarks: base of a culvert, several ephemeral channels flow into it — Stream channel that wetland is on is questionable — possibly ephemeral & not RY

SOILS

Map Unit Name (Series and Phase): StE Sunnyside fine sandy loam

Drainage Class: Well

Field Observations Confirm Mapped Type? Yes No

Taxonomy (Subgroup): Typic Normudults

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
					scl
			2.5YR4/6	C/D	
0-8+		10YR4/3			

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Soils disturbed & sitting on top of rip-rap.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No	(Circle)
Wetland Hydrology Present?	Yes	No	
Hydric Soils Present?	Yes	No	

(Circle)

Is this Sampling Point Within a Wetland? Yes No

Remarks: questionable area - disturbed

Approved by HQUSACE 3/92

Stream Features
Field Sheet

Date: 7/31/07 **Project Site:** PurpleLine **Wetland #:** WUS032

Observer(s): BG, HS, AT

Stream Flow:

Perennial: ______ **Intermittent** ✓ **Ephemeral** ______

Gradient: 0-1% **Classification:** R4SBX rip-rap

Approximate Drainage Basin: —

Morphology:

Avg. Channel Width 3.5' **Depth** 1' **Avg. Water Depth** no water present during field review

Has stream morphometry been altered? yes **Describe type and degree:**

straighten, rip-rap placed.

Habitat and Pollutants:

Substrate (predominant type (s)): rip-rap w/ sand

Habitat Complexity (Characterize) low - low flows, lack of habitat

Bank Erosion: **Severe** ______ **Moderate** ______ **Minor** ✓

Describe:

Silt Deposition: minor

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: —

Riparian Zone:

Development: narrow forested buffer & road

Riparian vegetation: **Forest** ______ **Shrubs** ______ **Herbs** ______

Dominant Species: box elder, sycamore, maple, poison ivy, multiflora rose

Approximate % shading by woody species: 90%

Steepness of adjacent slopes: 1-3%

Notes: flows out and into culvert that connects to WUS029

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Purple Line
Applicant/Owner: MTA
Investigator: BG, HS, AT

Date: 7-31-07
County: PG
State: MD

Do Normal Circumstances exist on the site? Yes **No**
Is the site significantly disturbed (Atypical Situation)? **Yes** No
Is the area a potential Problem Area? Yes **No**
(If needed, explain on reverse.)

Community ID: PEM1E
Transect ID:
Plot ID: TP-33-1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Typha latifolia	H	OBL	9.		
2. Juncus effusus	H	FACW+	10.		
3. Polygonum persicaria	H	FACW	11.		
4. Vernonia noveboracensis	H	FACW+	12.		
5. Scirpus validus	H	OBL	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
✓ No Recorded Data Available

Field Observations:

Depth of Surface Water: — (in.)

Depth to Free Water in Pit: — (in.)

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 Inches
✓ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: drought conditions

SOILS

Map Unit Name Bo
(Series and Phase): Bibb silt loam

Drainage Class: Poor

Taxonomy (Subgroup): Cumulic Normaquents

Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: fill w/ redox

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No (Circle)
Wetland Hydrology Present? Yes No
Hydric Soils Present? Yes No

Is this Sampling Point Within a Wetland? (Circle) Yes No

Remarks:

Approved by HQUSACE 2/92

Stream Features
Field Sheet

Date: 7/31/07 **Project Site:** PurpleLine **Wetland #:** WUS034

Observer(s): BG, HS, AT

Stream Flow:
Perennial: ____ **Intermittent** ✓ **Ephemeral** ____

Gradient: <1% **Classification:** R4SB2x

Approximate Drainage Basin: ——

Morphology:
Avg. Channel Width 4.5' **Depth** 3' **Avg. Water Depth** 3"

Has stream morphometry been altered? yes **Describe type and degree:**
channelized in parts, rip-rap placed

Habitat and Pollutants:
Substrate (predominant type (s)): rip-rap & sand.

Habitat Complexity (Characterize) low; lack stable habitat or undercut banks, riffles, pools

Bank Erosion: **Severe** ____ **Moderate** ✓ **Minor** ____

Describe: unvegetated banks

Silt Deposition: modrate

Pollutants (observation / potential sources): road runoff — lots of trash in channel

Stormwater Outfalls: ——

Riparian Zone:
Development: narrow forested buffer w/ (L) bank road, (R) bank residential

Riparian vegetation: **Forest** ✓ **Shrubs** ✓ **Herbs** ____

Dominant Species: Sycamore, maple, sweet gum, black locust, catalpa

Approximate % shading by woody species: 85%

Steepness of adjacent slopes: 0-3%

Notes:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Purple Line Applicant/Owner: MTA Investigator: BG, HS, AT	Date: 7/31/07 County: PG State: MD
Do Normal Circumstances Exist on the site? Yes No Is the site significantly disturbed (Atypical Situation)? Yes No Is the area a potential Problem Area? Yes No (If needed, explain on reverse.)	Community ID: PEM1E Transect ID: ____ Plot ID: TP-35

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Impatiens capensis		FACW	9.		
2. Boehmeria cylindrica		FACW+	10.		
3. Typha latifolia		FACW+	11.		
4. Polygonum perfoliatum		FAC*	12.		
5. Eupatoriadelphus maculatis		FACW	13.		
6. Carex lurida		OBL	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ___ Aerial Photographs ___ Other ✓ No Recorded Data Available Field Observations: Depth of Surface Water: — (in.) Depth to Free Water in Pit: — (in.) Depth to Saturated Soil: ___ (in.)	Wetland hydrology Indicators: Primary Indicators: ___ Inundated ___ Saturated in Upper 12 Inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits ___ Drainage Patterns in Wetlands Secondary Indicators (2 or more required): ___ Oxidized Root Channels in Upper 12" ___ Water-Stained Leaves ___ Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)

Remarks: - moist @ 2" - not saturated due to drought conditions
- floodplain wetland

SOILS

Map Unit Name
(Series and Phase): Bo Bibb silt loam

Drainage Class: Poor

Taxonomy (Subgroup): Cumulic Normaquents

Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-2		10YR 3/2			Si L
2-8		10YR 3/2	7.5YR 4/6	M/D	Si L
8+		10YR 3/2	7.5YR 4/6	M/D	Si Cl

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No	(Circle)
Wetland Hydrology Present?	Yes	No	
Hydric Soils Present?	Yes	No	

(Circle)

Is this Sampling Point Within a Wetland? Yes No

Remarks:

Approved by HQUSACE 3/92

Stream Features
Field Sheet

Date: 7/31/07 Project Site: Purpleline Wetland #: W036

Observer(s): BG, HS, AT

Stream Flow:

Perennial: ________ Intermittent ✓ Ephemeral ________

Gradient: ________ Classification: R4SBx

Approximate Drainage Basin: ________

Morphology:

Avg. Channel Width 3.5' Depth 1.5' Avg. Water Depth 1"

Has stream morphometry been altered? yes Describe type and degree:

straightened & filled w/ rip-rap.

Habitat and Pollutants:

Substrate (predominant type (s)): rip-rap

Habitat Complexity (Characterize) low; shallow flows, lack of habitat

Bank Erosion: Severe ________ Moderate ________ Minor ✓

Describe: ________

Silt Deposition: minor

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: /

Riparian Zone:

Development: no - forest & grass.

Riparian vegetation: Forest ________ Shrubs ________ Herbs ________

Dominant Species: sycamore, black willow, silver maple, catalpa

Approximate % shading by woody species: 95%

Steepness of adjacent slopes: 1%

Notes: flows out of culvert & into pond. flows from WUS034

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Purple Line Applicant/Owner: MTA Investigator: BG, HS, AT	Date: 7/31/07 County: PG State: MD
Do Normal Circumstances Exist on the site? Yes No Is the site significantly disturbed (Atypical Situation)? Yes No Is the area a potential Problem Area? Yes No (If needed, explain on reverse.)	Community ID: PEM1H Transect ID: Plot ID: TP-37

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Lythrum lineare		OBL	9.		
2. Phragmites australis		FACW	10.		
3. Sagittaria latifolia		OBL	11.		
4. Juncus effusus		FACW+	12.		
5. Solidago sp.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
____ Stream, Lake, or Tide Gauge
____ Aerial Photographs
____ Other
√ No Recorded Data Available

Field Observations:

Depth of Surface Water: ________(in.)

Depth to Free Water in Pit: ________(in.)

Depth to Saturated Soil: ________(in.)

Wetland hydrology Indicators:
Primary Indicators:
√ Inundated
____ Saturated in Upper 12 Inches
____ Water Marks
____ Drift Lines
____ Sediment Deposits
____ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
____ Oxidized Root Channels in Upper 12"
____ Water-Stained Leaves
____ Local Soil Survey Data
____ FAC-Neutral Test
____ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series and Phase): Bo Bibb silt loam

Drainage Class: Poor

Taxonomy (Subgroup): Cumulic Normaquents

Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: - soils not sampled due to inundation

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No (Circle)
Wetland Hydrology Present? Yes No
Hydric Soils Present? Yes No

(Circle)
Is this Sampling Point Within a Wetland? Yes No

Remarks:

Stream Features
Field Sheet

Date: 7-31-07 **Project Site:** Purple Line **Wetland #:** 038

Observer(s): BG, HS, AT

Stream Flow:
Perennial: ________ Intermittent X Ephemeral ________

Gradient: <1% Classification: R4SB2x

Approximate Drainage Basin: ________

Morphology:
Avg. Channel Width 4' Depth 1' Avg. Water Depth 2"

Has stream morphometry been altered? yes Describe type and degree:
Channelized culvert to culvert

Habitat and Pollutants:
Substrate (predominant type (s)): sand / rip-rap

Habitat Complexity (Characterize) very low - no riffle / pool sequences

Bank Erosion: Severe ________ Moderate ________ Minor X

Describe: ________

Silt Deposition: moderate

Pollutants (observation / potential sources): trash

Stormwater Outfalls: none

Riparian Zone:
Development: (L) bank - Road (R) Bank - Residential

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: Catalpa, cherry, t.p., poison ivy, grape vine

Approximate % shading by woody species: 95%

Steepness of adjacent slopes: 1%

Notes: ________

Stream Features
Field Sheet

Date: 8-02-07 Project Site: Purple Line Wetland # : 039

Observer(s): BG, HS, AT

Stream Flow:

Perennial: ________ Intermittent X Ephemeral ________

Gradient: ________ Classification: R4SB2x

Approximate Drainage Basin: ________

Morphology:

Avg. Channel Width 4.5' Depth 2' Avg. Water Depth 1"

Has stream morphometry been altered? yes Describe type and degree:

channelized along road

Habitat and Pollutants:

Substrate (predominant type (s)): Sand | rip-rap

Habitat Complexity (Characterize) low - shallow flows - no stable habitat

Bank Erosion: Severe ____ Moderate X Minor ____

Describe: eroding along sound wall - undermining

Silt Deposition: minor

Pollutants (observation / potential sources): road runoff, trash

Stormwater Outfalls: 2

Riparian Zone:

Development: L Ellin Road R Forest

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: Elm, arrow-wood, red maple, poison ivy, Japanese honeysuckle

Approximate % shading by woody species: 95%

Steepness of adjacent slopes: 1-10%

Notes:

Stream Features
Field Sheet

Date: 8-13-07 Project Site: Purple Line Wetland #: 040

Observer(s): BG, AT

Stream Flow:

Perennial: X Intermittent ______ Ephemeral ______

Gradient: <1% Classification: R2UB1/2

Approximate Drainage Basin: ______

Morphology:

Avg. Channel Width 5' Depth 2' Avg. Water Depth 3"

Has stream morphometry been altered? yes Describe type and degree:

channelized its entire length

Habitat and Pollutants:

Substrate (predominant type (s)): gravel/sand

Habitat Complexity (Characterize) low-moderate, riffle/run complexes, shade

Bank Erosion: Severe ______ Moderate X Minor ______

Describe: banks reinforced w/ rip-rap

Silt Deposition: minor

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: 1

Riparian Zone:

Development: R - Road L sewer line

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: Black locust, mimosa, ailanthus

Approximate % shading by woody species: 80%

Steepness of adjacent slopes: 1-5%

Notes: ______

Stream Features
Field Sheet

Date: 8-13-07 Project Site: Purple Line Wetland # : 041

Observer(s): BG, AT

Stream Flow:

Perennial: ________ Intermittent X Ephemeral ________

Gradient: <1% Classification: R4SB2

Approximate Drainage Basin: ________

Morphology:

Avg. Channel Width 6.5' Depth 2' Avg. Water Depth none

Has stream morphometry been altered? No Describe type and degree:

near road-scour at culvert

Habitat and Pollutants:

Substrate (predominant type (s)): Sand

Habitat Complexity (Characterize) low due to shallow flows

Bank Erosion: Severe ______ Moderate ________ Minor X

Describe: —

Silt Deposition: heavy

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: —

Riparian Zone:

Development: R - Road

Riparian vegetation: Forest ✓ Shrubs ✓ Herbs —

Dominant Species: Red maple, ash, spicebush, English ivy

Approximate % shading by woody species: 95%

Steepness of adjacent slopes: 1%

Notes: ________

Stream Features
Field Sheet

Date: 8-13-07 **Project Site:** Purple Line **Wetland #:** 042

Observer(s): BL, AT

Stream Flow:
Perennial: ________ Intermittent X Ephemeral ________

Gradient: <1% Classification: R4SB2

Approximate Drainage Basin: ________

Morphology:
Avg. Channel Width 3' Depth 2.5' Avg. Water Depth none

Has stream morphometry been altered? no Describe type and degree:

Habitat and Pollutants:
Substrate (predominant type (s)): Sand

Habitat Complexity (Characterize) very low - shallow flows

Bank Erosion: Severe ______ Moderate X Minor ______

Describe: failing banks

Silt Deposition: moderate

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: none

Riparian Zone:
Development: (L) Road

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: Black oak, tulip poplar, ground ivy

Approximate % shading by woody species: 80%

Steepness of adjacent slopes: 1-2%

Notes:

Stream Features
Field Sheet

Date: 8-15-07 Project Site: Purple Line Wetland #: 043

Observer(s): BO, HS

Stream Flow:

Perennial: X Intermittent ____ Ephemeral ____

Gradient: <1% Classification: R2UB1/2

Approximate Drainage Basin: ____

Morphology:

Avg. Channel Width 10' Depth 5' Avg. Water Depth 3"

Has stream morphometry been altered? No Describe type and degree:

undisturbed, natural

Habitat and Pollutants:

Substrate (predominant type (s)): gravel | sand

Habitat Complexity (Characterize) moderate - high - deep pools, undercut banks, woody debris

Bank Erosion: Severe X Moderate ____ Minor ____

Describe: unvegetated banks, vertical

Silt Deposition: minor

Pollutants (observation / potential sources): none

Stormwater Outfalls: none

Riparian Zone:

Development: None

Riparian vegetation: Forest ✓ Shrubs ✓ Herbs ✓

Dominant Species: Chestnut oak, white oak, red maple ironwood

Approximate % shading by woody species: 98%

Steepness of adjacent slopes: 1-20%

Notes:

open ended.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Purple Line	Date: 8/15/07
Applicant/Owner: MTA	County: PG
Investigator: BG, HS	State: MD
Do Normal Circumstances Exist on the site? **Yes** No	Community ID: PFO1C
Is the site significantly disturbed (Atypical Situation)? Yes **No**	Transect ID: W044
Is the area a potential Problem Area? Yes **No** (If needed, explain on reverse.)	Plot ID: TP44

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Liquidambar styraciflua	T	FAC	9.		
2. Acer rubrum	T	FAC	10.		
3. Quercus phellos	S	FAC+	11.		
4. Thelypteris noveboracensis	H	FAC	12.		
5. Dichanthelium acuminatum	H	FAC	13.		
6. Dichanthelium clandestinum	H	FAC+	14.		
7. Smilax rotundifolia		FAC	15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks: visual estimate of dominance.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

✓ No Recorded Data Available

Field Observations:

Depth of Surface Water: ___ (in.)

Depth to Free Water in Pit: ___ (in.)

Depth to Saturated Soil: ___ (in.)

Wetland hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ✓ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12"
- ✓ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: groundwater seep in floodplain - soils were very dry during field review due to lack of precip. this summer.

SOILS

Map Unit Name
(Series and Phase): Bibb silt loam Bo

Drainage Class: Poor

Taxonomy (Subgroup): Cumulic Normaquents

Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-2		10YR4/2			Sicl
2-6		10YR4/2	7.5YR2.5/3	F/D	Sicl
6+		10YR4/2	10YR5/8	M/F	Sicl

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: soils very dry during field review so it was difficult to pull a decent profile.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No (Circle)
Wetland Hydrology Present? Yes No
Hydric Soils Present? Yes No

Is this Sampling Point Within a Wetland? (Circle) Yes No

Remarks:

Approved by HQUSACE 3/92

W045

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Purple Line Applicant/Owner: MTA Investigator: BG, HS	Date: 8-15-07 County: PG State: MD
Do Normal Circumstances Exist on the site? Yes No Is the site significantly disturbed (Atypical Situation)? Yes No Is the area a potential Problem Area? Yes No (If needed, explain on reverse.)	Community ID: PFO1E Transect ID: Plot ID: W045-1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Saururus cernus	H	OBL	9.		
2. Boehmeria cylindrica	H	FACW+	10.		
3. Glyceria striata	H	OBL	11.		
4. Acer rubrum	C	FAC	12.		
5. Polygonum persicaria	H	FACW	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

✓ No Recorded Data Available

Field Observations:

Depth of Surface Water: — (in.)

Depth to Free Water in Pit: — (in.)

Depth to Saturated Soil: 0 (in.)

Wetland hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ✓ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ✓ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12"
- ✓ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: pond outlets into wetland - providing a constant source of hydrology

SOILS

Map Unit Name Bo
(Series and Phase): Bibb silt loam

Drainage Class: Poor

Field Observations
Confirm Mapped Type? Yes No

Taxonomy (Subgroup): Cumulic Normaquents

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-2		10YR4/3	7.5YR 4/6	C, D	SiCl
2-8		10YR4/2	7.5YR4/6	C, D	SiCl
8+		10YR5/2	7.5YR5/8, 4/6	M, D	

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No (Circle)
Wetland Hydrology Present? Yes No
Hydric Soils Present? Yes No

(Circle)
Is this Sampling Point Within a Wetland? Yes No

Remarks:

open ended.

Stream Features
Field Sheet

Date: 8/15/07 **Project Site:** PurpleLine **Wetland # :** WUS046

Observer(s): HS, MB

Stream Flow:
Perennial: ✓ Intermittent ______ Ephemeral ______

Gradient: < 1% Classification: R2UB1/2

Approximate Drainage Basin: ______

Morphology:
Avg. Channel Width 14' Depth 4' Avg. Water Depth 8"

more narrow west of river Rd. 6' wide. 3' deep; 4" wat

Has stream morphometry been altered? yes. Describe type and degree:
channelized rip-rap placed near culvert

Habitat and Pollutants:
Substrate (predominant type (s)): Sand, gravel

Habitat Complexity (Characterize) moderate, some undercut banks, woody debris, few deep pools, not much.

Bank Erosion: Severe ______ Moderate ______ Minor ✓

Describe: some undercut banks

Silt Deposition: moderate

Pollutants (observation / potential sources): road runoff, moderate amount of trash observed

Stormwater Outfalls: 3

Riparian Zone:
Development: very narrow forested buffer w/parking lot on (L) & road/building on (R)

Riparian vegetation: Forest ✓ Shrubs ✓ Herbs ______

Dominant Species: catalpa, elm, sycamore, box elder, willow, green brier, bush honeysuckle, Japanese honeysuckle, jap. hops

Approximate % shading by woody species: 95%

Steepness of adjacent slopes: 5-10%

Notes: ______

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Purple Line Applicant/Owner: MTA Investigator: BG, HS	Date: 8-15-07 County: PG State: MD
Do Normal Circumstances Exist on the site? Yes **No** Is the site significantly disturbed (Atypical Situation)? **Yes** No Is the area a potential Problem Area? Yes **No** (If needed, explain on reverse.)	Community ID: PSS1H Transect ID: WD4D Plot ID: no plot

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Typha latifolia	H	OBL	9.		
2. Betula nigra	S	FACW	10.		
3. Salix nigra	S	FACW+	11.		
4. Sagittaria latifolia	H	OBL	12.		
5. Boehmeria cylindrica	H	FACW+	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
 ___ Stream, Lake, or Tide Gauge
 ___ Aerial Photographs
 ___ Other
✓ No Recorded Data Available

Field Observations:

Depth of Surface Water: unknown (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soil: 0 (in.)

Wetland hydrology Indicators:
Primary Indicators:
✓ Inundated
✓ Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
___ Oxidized Root Channels in Upper 12"
✓ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks:
wet pond

SOILS

Map Unit Name KeC2
(Series and Phase): Keyport fine sandy loam

Drainage Class: moderately well

Field Observations
Confirm Mapped Type? Yes No

Taxonomy (Subgroup): Paraquic Normudults

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

no soils taken due to inundation

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No (Circle)
Wetland Hydrology Present? Yes No
Hydric Soils Present? Yes No

(Circle)
Is this Sampling Point Within a Wetland? Yes No

Remarks:

Approved by HQUSACE 3/92

Stream Features
Field Sheet

Date: 8-15-07 Project Site: Purple Line Wetland #: WVS 048

Observer(s): BG, HS

Stream Flow:

Perennial: ______ Intermittent X Ephemeral ______

Gradient: 1% Classification: R4SB2x

Approximate Drainage Basin: ______

Morphology:

Avg. Channel Width 14 Depth 9' Avg. Water Depth none

Has stream morphometry been altered? yes Describe type and degree:

straightened and rip-rap the entire length

Habitat and Pollutants:

Substrate (predominant type (s)): rip-rap

Habitat Complexity (Characterize) very low - very shallow flows

Bank Erosion: Severe X Moderate ______ Minor ______

Describe: failing banks, unvegetated, extensive scour

Silt Deposition: mod.

Pollutants (observation / potential sources): none

Stormwater Outfalls: 1

Riparian Zone:

Development: none

Riparian vegetation: Forest ✓ Shrubs ✓ Herbs X

Dominant Species: Sweet gum, red maple, poison ivy, Joe Pye weed

Approximate % shading by woody species: 90%

Steepness of adjacent slopes: 1-10%

Notes: stream drains from pond inside pond - extreme headcutting occurring

Stream Features
Field Sheet

Date: 8-28-07 Project Site: Purple Line Wetland #: 049

Observer(s): BG, HS, AT

Stream Flow:
Perennial: X Intermittent ____ Ephemeral ____

Gradient: <1% Classification: R2UB2

Approximate Drainage Basin: —

Morphology:
Avg. Channel Width 10' Depth 4' Avg. Water Depth 2'

Has stream morphometry been altered? yes Describe type and degree:
Channelized along edge of parking lot

Habitat and Pollutants:
Substrate (predominant type (s)): Sand

Habitat Complexity (Characterize) low - no riffle/pool structure, heavy silt deposition

Bank Erosion: Severe ____ Moderate ____ Minor X

Describe: —

Silt Deposition: heavy

Pollutants (observation / potential sources): road runoff, chemical smell

Stormwater Outfalls: none

Riparian Zone:
Development: R Bank - wetland, L Bank - Parking lot

Riparian vegetation: Forest ____ Shrubs X Herbs X

Dominant Species: Black willow, phragmites, tearthumb

Approximate % shading by woody species: 5%

Steepness of adjacent slopes: 1%

Notes:

Stream Features
Field Sheet

Date: 8-28-07 Project Site: Purple line Wetland #: 050

Observer(s): BG, HS, AT

Stream Flow:
Perennial: X Intermittent ____ Ephemeral ____

Gradient: <1% Classification: R2UB2

Approximate Drainage Basin: ____

Morphology:
Avg. Channel Width 6' Depth 3' Avg. Water Depth 2'

Has stream morphometry been altered? yes Describe type and degree:
channelized to culvert

Habitat and Pollutants:
Substrate (predominant type (s)): Sand

Habitat Complexity (Characterize) low - heavy silt deposition

Bank Erosion: Severe ____ Moderate ____ Minor X

Describe: ____

Silt Deposition: heavy

Pollutants (observation / potential sources): chemical smell

Stormwater Outfalls: —

Riparian Zone:
Development: R bank - wetland L Bank parking lot

Riparian vegetation: Forest ____ Shrubs x Herbs x

Dominant Species: Buttonbush, tearthumb, multiflora rose

Approximate % shading by woody species: 80%

Steepness of adjacent slopes: 1-20%

Notes: ____

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Purple Line Applicant/Owner: MTA Investigator: BG, HS, AT	Date: 8/28/07 County: PG State: MD
Do Normal Circumstances Exist on the site? **Yes** No Is the site significantly disturbed (Atypical Situation)? Yes **No** Is the area a potential Problem Area? Yes **No** (If needed, explain on reverse.)	Community ID: PSS/E Transect ID: W0511 Plot ID: TP 51-1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Salix nigra	S	FACW+	9.		
2. Sagittaria latifolia	H	OBL	10. Lythrum Salicaria	H	FACW+
3. Polygonum pennsylvanicum	H	FACW	11.		
4. Polygonum hydropiper	H	OBL	12.		
5. Polygonum hydropiperoides	H	OBL	13.		
6. Schoenoplectus tabernaemontani	H	OBL	14.		
7. Cyperus strigosus	H	FACW	15.		
8. Sambucus nigra canadensis	S	FACW-	16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). ____

Remarks: visual estimate of dominance.

HYDROLOGY

___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ___ Aerial Photographs ___ Other ___ No Recorded Data Available	Wetland hydrology Indicators: Primary Indicators: ___ Inundated ✓ Saturated in Upper 12 Inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits ✓ Drainage Patterns in Wetlands Secondary Indicators (2 or more required): ___ Oxidized Root Channels in Upper 12" ___ Water-Stained Leaves ___ Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: — (in.) Depth to Free Water in Pit: 0 (in.) Depth to Saturated Soil: 0 (in.)	

Remarks:

SOILS

Map Unit Name Bo
(Series and Phase): Bibb silt loam

Drainage Class: Poor

Field Observations
Confirm Mapped Type? Yes No

Taxonomy (Subgroup): Cumulic Normaquents

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4		10YR3/2	—	—	sicl w/ lots of rootlets + organics.
4-6		10YR3/2	7.5YR3/4	M/D	sicl
6+	Fill				

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No (Circle)
Wetland Hydrology Present? Yes No
Hydric Soils Present? Yes No

(Circle)
Is this Sampling Point Within a Wetland? Yes No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Purple Line Applicant/Owner: MTA Investigator: BG, HS, AT	Date: 8-28-07 County: PG State: MD
Do Normal Circumstances Exist on the site? Yes **No** Is the site significantly disturbed (Atypical Situation)? Yes **No** Is the area a potential Problem Area? **Yes** No (If needed, explain on reverse.)	Community ID: PSS1E Transect ID: Plot ID: TP1S1-2

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Typha latifolia	H	OBL	9.		
2. Polygonum hydropiperoides	H	OBL	10.		
3. Leersia oryzoides	H	OBL	11.		
4. Boehmeria cylindrica	H	FACW+	12.		
5. Cephalanthus occidentalis	S	OBL	13.		
6. Salix nigra	H	FACW+	14.		
7. Porcelain berry	H		15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-).

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
____ Stream, Lake, or Tide Gauge
____ Aerial Photographs
____ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0.5 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soil: 0 (in.)

Wetland hydrology Indicators:
Primary Indicators:
✓ Inundated
✓ Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
___ Oxidized Root Channels in Upper 12"
✓ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name Bo
(Series and Phase): Bilt silt loam

Drainage Class: Poor

Field Observations
Confirm Mapped Type? Yes No

Taxonomy (Subgroup): Cumulic Normaquents

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-3		2.5Y3/1	—	—	SiCl
3-6		2.5Y4/2	10YR3/6	F, D	SiCl
6+		7.5YR5/4	7.5YR5/8	C, F	Cl

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No (Circle)
Wetland Hydrology Present? Yes No
Hydric Soils Present? Yes No

Is this Sampling Point Within a Wetland? Yes No (Circle)

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Purple Line Applicant/Owner: MTA Investigator: BG, HS	Date: 8/28/07 County: PG State: MD
Do Normal Circumstances Exist on the site? Yes No Is the site significantly disturbed (Atypical Situation)? Yes No Is the area a potential Problem Area? Yes No (If needed, explain on reverse.)	Community ID: UPL Transect ID: Plot ID: TP851-3

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Acer negundo	T		9.		
2. Acer saccharinum	T		10.		
3. Prunus sp.	T		11.		
4. Lonicera japonica			12.		
5. Rubus sp.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-).

Remarks: Visual estimate.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: ________(in.)

Depth to Free Water in Pit: ________(in.)

Depth to Saturated Soil: ________(in.)

Wetland hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12"
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name BO
(Series and Phase): Bibb silt loam

Drainage Class: Poor
Field Observations
Confirm Mapped Type? Yes No

Taxonomy (Subgroup): Cumulic Normaquents

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-2		10YR3/3	—	—	\
2-4		10YR5/6	Mixed w/ Fill		SiCl
4+	FILL				

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No (Circle)
Wetland Hydrology Present? Yes No
Hydric Soils Present? Yes No

(Circle)
Is this Sampling Point Within a Wetland? Yes No

Remarks:

Stream Features
Field Sheet

Date: 8-28-07 Project Site: Purple Line Wetland #: 052

Observer(s): BG, HS, AT

Stream Flow:
Perennial: X Intermittent ______ Ephemeral ______

Gradient: <1% Classification: R2UB3

Approximate Drainage Basin: ______

Morphology:
Avg. Channel Width 4.5' Depth 2' Avg. Water Depth 2"

Has stream morphometry been altered? No Describe type and degree:

______

Habitat and Pollutants:
Substrate (predominant type (s)): mud

Habitat Complexity (Characterize) very low, no riffle/pool structure

Bank Erosion: Severe ______ Moderate ______ Minor X

Describe: —

Silt Deposition: heavy

Pollutants (observation / potential sources): road runoff - film on top of water

Stormwater Outfalls: none

Riparian Zone:
Development: (L) Bank - Corporate Drive (R) wetland

Riparian vegetation: Forest ______ Shrubs X Herbs X

Dominant Species: Catalpa, M.F., poison ivy, elderberry, porcelain berry

Approximate % shading by woody species: 100%

Steepness of adjacent slopes: 1-15%

Notes: ______

Stream Features
Field Sheet

Date: 8.28.07 Project Site: Purple Line Wetland # : 053

Observer(s): BG, HS, AT

Stream Flow:
Perennial: ______ Intermittent X Ephemeral ______

Gradient: <1% Classification: R4SB2

Approximate Drainage Basin: ______

Morphology:
Avg. Channel Width 10' Depth 4' Avg. Water Depth 2'

Has stream morphometry been altered? yes Describe type and degree:
channelized until its confluence w/ wetland

Habitat and Pollutants:
Substrate (predominant type (s)): sand

Habitat Complexity (Characterize) very low

Bank Erosion: Severe ______ Moderate X Minor ______

Describe: undercut banks

Silt Deposition: heavy

Pollutants (observation / potential sources): trash / chemical smell

Stormwater Outfalls: none

Riparian Zone:
Development: ______

Riparian vegetation: Forest ______ Shrubs X Herbs X

Dominant Species: M.F., silky dogwood, black willow, catalpa

Approximate % shading by woody species: 10%

Steepness of adjacent slopes: 1%

Notes: ______

Stream Features
Field Sheet

Date: 8-28-07 Project Site: Purple Line Wetland #: 054

Observer(s): BG, HS, AT

Stream Flow:
Perennial: ______ Intermittent X Ephemeral ______

Gradient: 1% Classification: R4SB2

Approximate Drainage Basin: ______

Morphology:
Avg. Channel Width 5' Depth 2' Avg. Water Depth 4"

Has stream morphometry been altered? No Describe type and degree:

Habitat and Pollutants:
Substrate (predominant type (s)): sand

Habitat Complexity (Characterize) Several riffles / pools
Some habitat for fish

Bank Erosion: Severe ______ Moderate ______ Minor X

Describe: —

Silt Deposition: heavy

Pollutants (observation / potential sources): none

Stormwater Outfalls: None

Riparian Zone:
Development: None

Riparian vegetation: Forest ______ Shrubs X Herbs X

Dominant Species: Sambucus nigra canadensis, Willow, poison ivy, M.F,

Approximate % shading by woody species: 70%

Steepness of adjacent slopes: 1-10%

Notes:

W55

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Purple Line Applicant/Owner: MTA Investigator: BG, HS	Date: 1-20-07 County: PG State: MD
Do Normal Circumstances Exist on the site? **Yes** No Is the site significantly disturbed (Atypical Situation)? Yes **No** Is the area a potential Problem Area? Yes **No** (If needed, explain on reverse.)	Community ID: PSS1E Transect ID: Plot ID: PSS-1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Leersia oryzoides	H	OBL	9. Polygonum persicaria	H	FACW
2. Salix nigra	S	FACW+	10. Eupatorium serotinum	H	FAC-
3. Alnus serrulata	S	OBL	11.		
4. Eupatorium perfoliatum	H	FACW+	12.		
5. Polygonum sagittatum	H	OBL	13.		
6. Scirpus validus	H	OBL	14.		
7. Typha latifolia	H	OBL	15.		
8. Bidens sp.	H	—	16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-).

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ___ Aerial Photographs ___ Other ✓ No Recorded Data Available	Wetland hydrology Indicators: Primary Indicators: ✓ Inundated ✓ Saturated in Upper 12 Inches ___ Water Marks ___ Drift Lines ✓ Sediment Deposits ✓ Drainage Patterns in Wetlands Secondary Indicators (2 or more required): ___ Oxidized Root Channels in Upper 12" ___ Water-Stained Leaves ___ Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: — (in.) Depth to Free Water in Pit: 10 (in.) Depth to Saturated Soil: 0 (in.)	

Remarks:

SOILS

Map Unit Name (Series and Phase): Bibb silt loam

Drainage Class: Poor

Field Observations Confirm Mapped Type? Yes **No**

Taxonomy (Subgroup):

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-5		10YR 4/6	10YR 5/8	F, F	SIC
5-8		5Y 4/2	10YR 6/6	C, P	SICl
8+		5Y 3/1	10YR 5/6	C, P	CSl

Buried organics & mottles

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**Yes**	No	(Circle)
Wetland Hydrology Present?	**Yes**	No	
Hydric Soils Present?	**Yes**	No	

(Circle)

Is this Sampling Point Within a Wetland? **Yes** No

Remarks:

Stream Features
Field Sheet

Date: 9/19/07 **Project Site:** Purple Line **Wetland #:** WUS056

Observer(s): BG, HS

Stream Flow:
Perennial: ✓ Intermittent ____ Ephemeral ____

Gradient: <1% Classification: R2UB3

Approximate Drainage Basin: ____

Morphology:
Avg. Channel Width 2 1/2' Depth 2' Avg. Water Depth 1"

Has stream morphometry been altered? yes Describe type and degree:
banks reinforced w/ rip-rap.

Habitat and Pollutants:
Substrate (predominant type (s)): mud

Habitat Complexity (Characterize) low, low flows, lack of stable habitat

Bank Erosion: Severe ____ Moderate ✓ Minor ____

Describe: undercut banks

Silt Deposition: minor

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: Ø

Riparian Zone:
Development: none, forested buffer / sewer line crossing

Riparian vegetation: Forest ✓ Shrubs ____ Herbs ____

Dominant Species: Sweet gum, maple, tulip poplar.

Approximate % shading by woody species: 70%

Steepness of adjacent slopes: 1-25% (road berm.

Notes: flows from wetland W055

Appendix D

Wetland Function -Value

Evaluation Forms

Wetland Function-Value Evaluation Form

Total area of wetland 0.5 acres Human made? No Is wetland part of a wildlife corridor? Yes Or a "habitat island"? No

Adjacent land use Roadway / Residential Distance to nearest roadway or other development 50'

Dominant wetland system present PSS Contiguous undeveloped buffer zone present Yes

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? lower

How many tributaries contribute to the wetland? 1 Wildlife & vegetation diversity/abundance (see attached list) ______

PROJECT: Purple Line

Wetland ID W0S6

Longitude ______ Latitude ______

Wetland Impacts:
Type PSS Area 0.5 acres

Prepared by: BG Date 7-20-07

Evaluation based on:
Office X Field X

Corps manual wetland delineation completed?
Y X N ___

Function/Value	Occurrence Y	Occurrence N	Rationale (reference #)	Principal Function(s)/Value(s)	Comments	Excluded
Groundwater Recharge/Discharge	X		1 2 4 5 7 8 9 12 13 14 15 16	X		
Floodflow Alteration	X		3 4 5 6 7 8 9 10 11 13 16 17 18	X		3,11,17,18
Fish and Shellfish Habitat	X		1 2 4 8 9 10 14 16 17	X		19
Sediment Toxicant Retention	X		1-5 7 8 9 10 11 12 13 15 16	X		18
Nutrient Removal	X		3 4 5 6 ~~7~~ 8 9 11 12 13 14 15	X		6,17
Production Export	X		1 2 4 5 6 7 8 10 11 12	X		10,16
Sediment/Shoreline Stabilization	X		1 3 5 6 8 9 12 13 15	X		15
Wildlife Habitat	X		1 3 5 6 7 8 9 11 13 14 15 17 18 19 20 22	X		16
Recreation	X		4 5 6 7 12			2,16,24
Educational Scientific Value	X		4 5 11			13
Uniqueness/Heritage	X		1 2 5 6 11 13 16 17 19 22 31			17
Visual Quality/Aesthetics	X		2 3 4 7 8 11	X		32
Endangered Species						13
Other						3

Notes:

E

Wetland Function-Value Evaluation Form

Total area of wetland 2.5 Human made? No Is wetland part of a wildlife corridor? No Or a "habitat island"? Yes

Adjacent land use Commercial Distance to nearest roadway or other development 25'

Dominant wetland system present PSS Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? upper

How many tributaries contribute to the wetland? 3 Wildlife & vegetation diversity/abundance (see attached list) ____

PROJECT: Purple Line

Wetland ID W051

Longitude ____ Latitude ____

Wetland Impacts: Type PSS Area ____

Prepared by: BG Date 8-28-07

Evaluation based on:

Office X Field X

Corps manual wetland delineation completed?

Y X N ____

Function/Value	Occurrence Y	Occurrence N	Rationale (reference #)	Principal Function(s)/Value(s)	Comments	Excluded
Groundwater Recharge/Discharge	X		1 2 4 5 7 8 9 13 14 15 16	X		
Floodflow Alteration	X		2 3 4 7 8 9 10 11 12 14 16 17 5 6	X		3,11,17,18
Fish and Shellfish Habitat	X		2 3 4 7 8 9 10 11 12 14 16 17	X		19
Sediment Toxicant Retention	X		1 2 3 4 5 7 8 10 11 12 13 14 15 16	X		18
Nutrient Removal	X		2 3 4 5 6 7 ~~8~~ 9 11 12 13 14 15	X		6,17
Production Export	X		1 3 4 5 6 7 8 9 10 11 12 13 14	X		10,16
Sediment/Shoreline Stabilization	X		1 3 5 6 8 9 12 13 14 15	X		15
Wildlife Habitat	X		6 8 9 11 13 14 15 17 18 19 20 21 22	X		16
Recreation	X		2 12			2,16,24
Educational Scientific Value	X		11			13
Uniqueness/Heritage	X		1 2 3 5 6 7 13 15 19 22			17
Visual Quality/Aesthetics	X		4 6			32
Endangered Species						13
Other						3

Notes:

Wetland Function-Value Evaluation Form

Total area of wetland 0.6 Human made? No Is wetland part of a wildlife corridor? Yes Or a "habitat island"? No

Adjacent land use Parkland Distance to nearest roadway or other development 453'

Dominant wetland system present PFO Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? Yes If not, where does the wetland lie in the drainage basin? ______

How many tributaries contribute to the wetland? Ø Wildlife & vegetation diversity/abundance (see attached list) ______

PROJECT: Purple Line

Wetland ID W045

Longitude ______ Latitude ______

Wetland Impacts: Type PFO Area ______

Prepared by: BG Date 8-15-07

Evaluation based on:

Office X Field X

Corps manual wetland delineation completed?

Y X N __

Function/Value	Occurrence Y	Occurrence N	Rationale (reference #)	Principal Function(s)/Value(s)	Comments	Excluded
Groundwater Recharge/Discharge	X		1 2 4 5 7 8 9 13 14 15 16	X		
Floodflow Alteration	X		3 4 5 6 7 8 9 10 11 13 16 17 18	X		3,11,17,18
Fish and Shellfish Habitat	X		2 4 7 8 10 16 17			19
Sediment Toxicant Retention	X		1 2 4 5 8 10 12 13 14 16	X		18
Nutrient Removal	X		3 4 5 7 9 11 12 13 14 15	X		6,17
Production Export	X		1 3 4 5 6			10,16
Sediment/Shoreline Stabilization	X		1 3 5 6 8 9 12 14 15	X		15
Wildlife Habitat	X		3 6 7 8 17 18 20 21 22 11			16
Recreation	X		1 12			2,16,24
Educational Scientific Value	X		8 11			13
Uniqueness/Heritage	X		1 2 5 7 13 19 22 31			17
Visual Aesthetics	X		6			32
						13
						3

Wetland Function-Value Evaluation Form

Total area of wetland 0.5+ Human made? No Is wetland part of a wildlife corridor? Yes Or a "habitat island"? No

Adjacent land use Park, Commercial Distance to nearest roadway or other development 100'

Dominant wetland system present PFO Contiguous undeveloped buffer zone present Yes

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? lower

How many tributaries contribute to the wetland? ___ Wildlife & vegetation diversity/abundance (see attached list) ___

PROJECT: Purple Line

Wetland ID Wetland 8

Longitude ___ Latitude ___

Wetland Impacts: Type PFO Area 0.5

Prepared by: BG Date 9/11/07

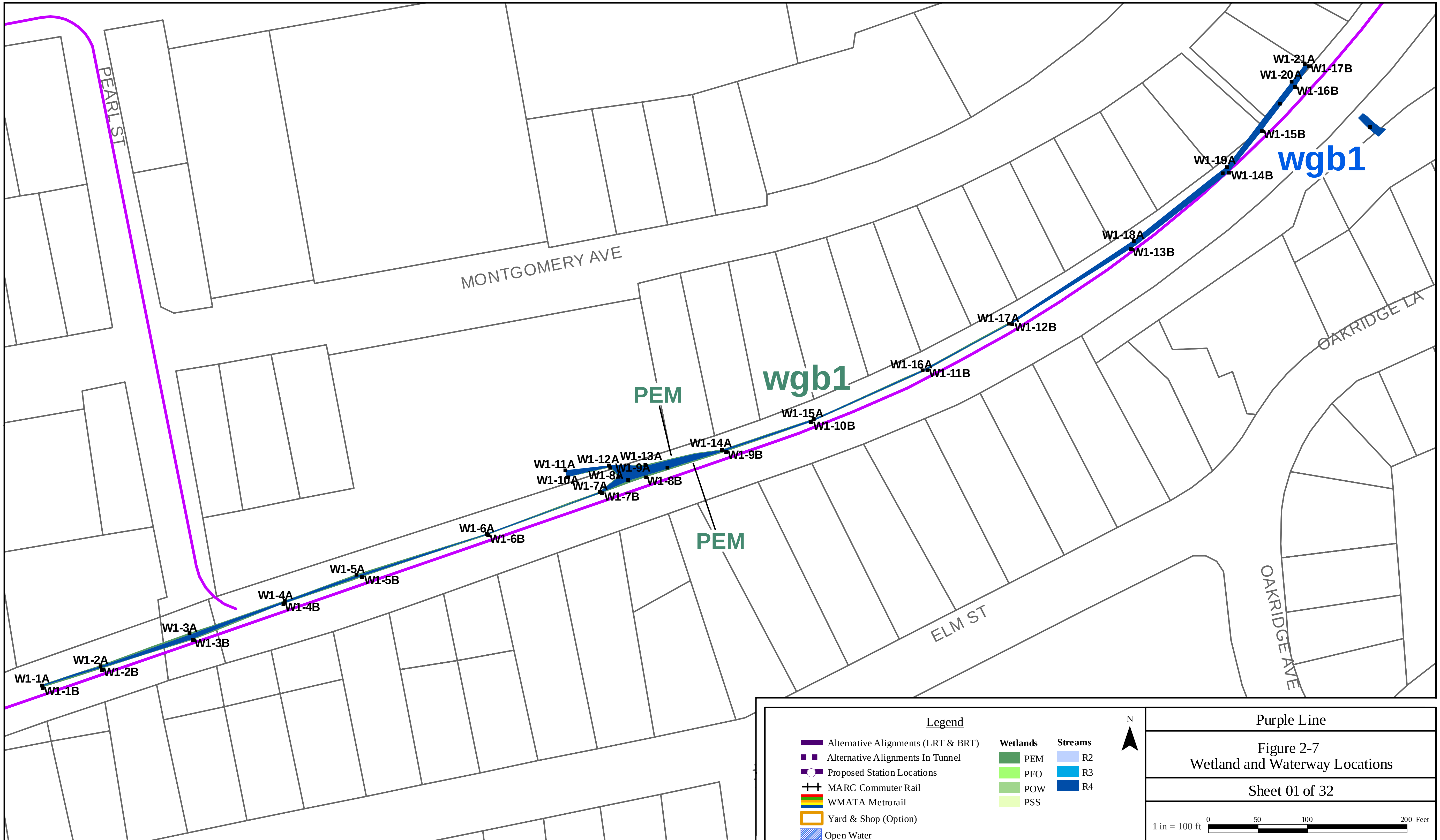
Evaluation based on:
Office ___ Field X

Corps manual wetland delineation completed?
Y X N ___

Function/Value	Occurrence Y	Occurrence N	Rationale (reference #)	Principal Function(s) /Value(s)	Comments	Excluded
Groundwater Recharge/Discharge	X		1 2 4 5 7 9 16			3,11,17,18
Floodflow Alteration	X		4 5 6 7 8 9 10 11 13 16 17 18	X		19
Fish and Shellfish Habitat	X		1 2 3 4 6 7 8 9 10 11 12 14 15 16 17	X	Rock Creek	18
Sediment Toxicant Retention	X		1 2 3 4 7 8 9 10 11 12 15 16	X		6,17
Nutrient Removal	X		3 4 8 9 11 12 13 14	X		10,16
Production Export	X		1 2 4 5 6 7 8 12 13	X		15
Sediment/Shoreline Stabilization	X		3 5 6 7 8 9 12 14	X		16
Wildlife Habitat	X		1 3 5 6 7 8 13 14 15 17 18 21 22	X		2,16,24
Recreation	X		1 2 4 5 6 7 8 10 11 12	X	Rock Creek Stream Valley Park	13
Educational Scientific Value	X		2 5 8 9 10 11 14 15	X		17
Uniqueness/Heritage	X		1 2 7 8 9 11 14 15 16 19 22 27 28 31			32
Visual Quality/Aesthetics	X		6 8			13
Endangered Species						3
Other						

Notes:

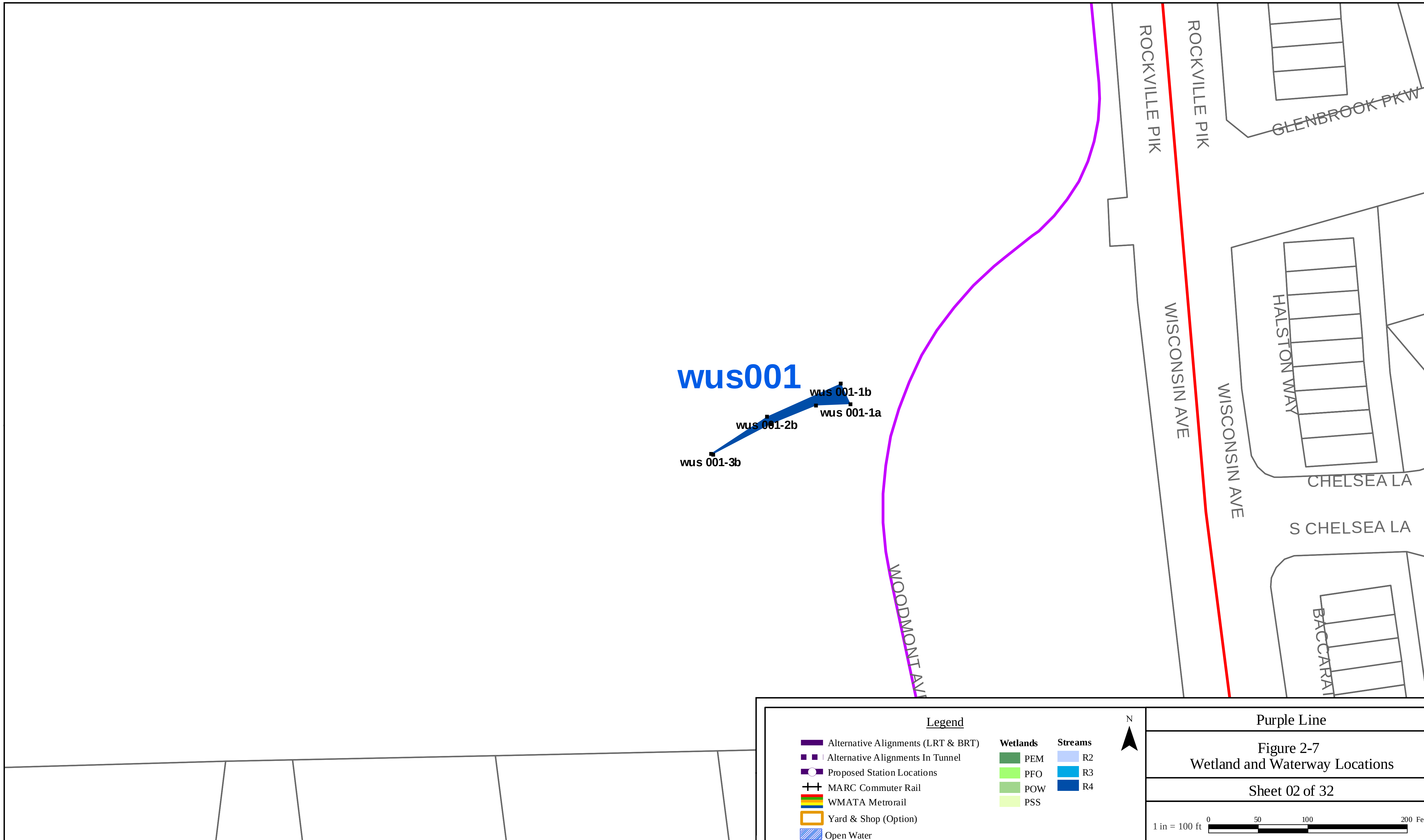
Appendix E
Detailed Waters of the United States, including Wetlands Mapping



Purple Line

Figure 2-7
Wetland and Waterway Locations

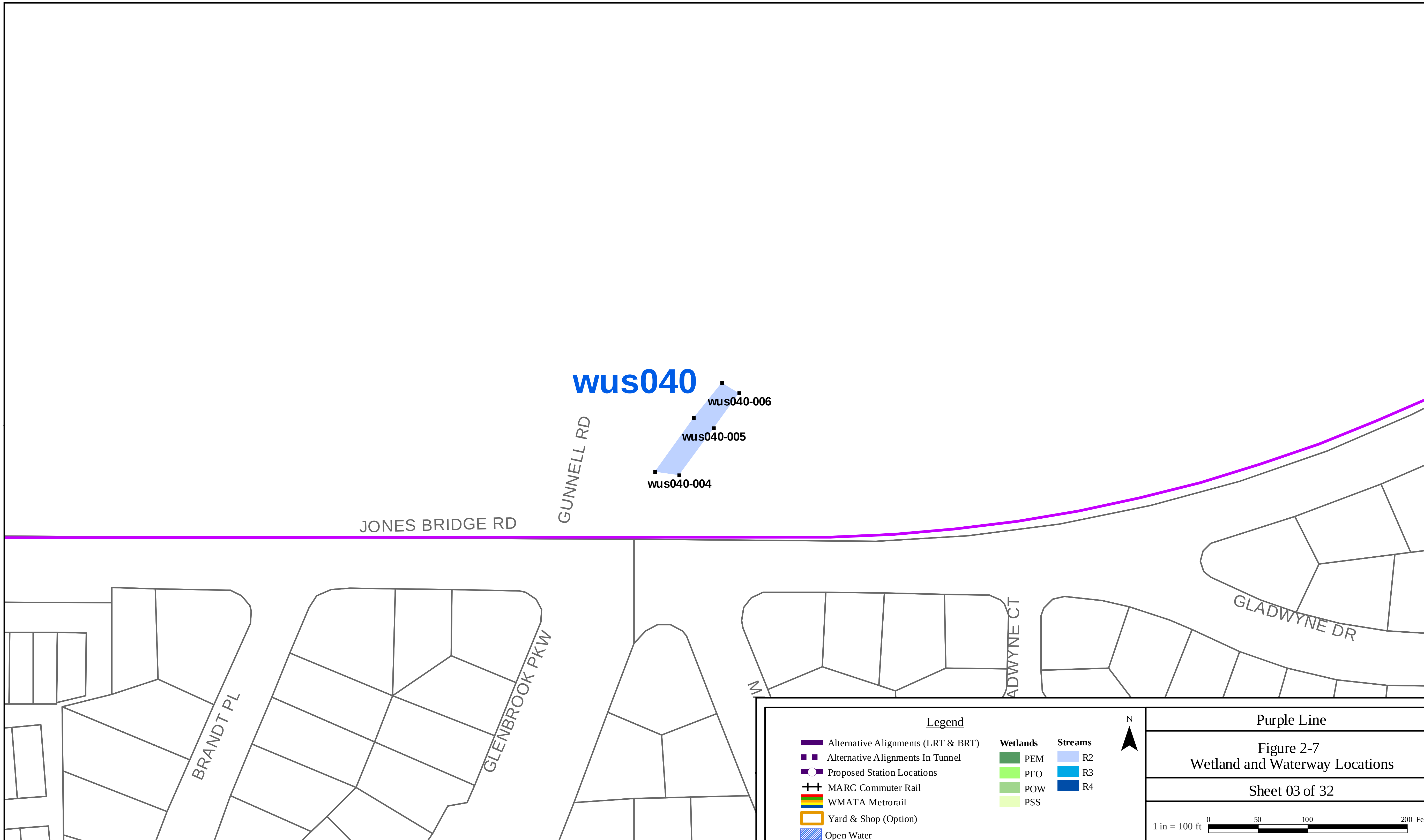
Sheet 01 of 32



Purple Line

Figure 2-7
Wetland and Waterway Locations

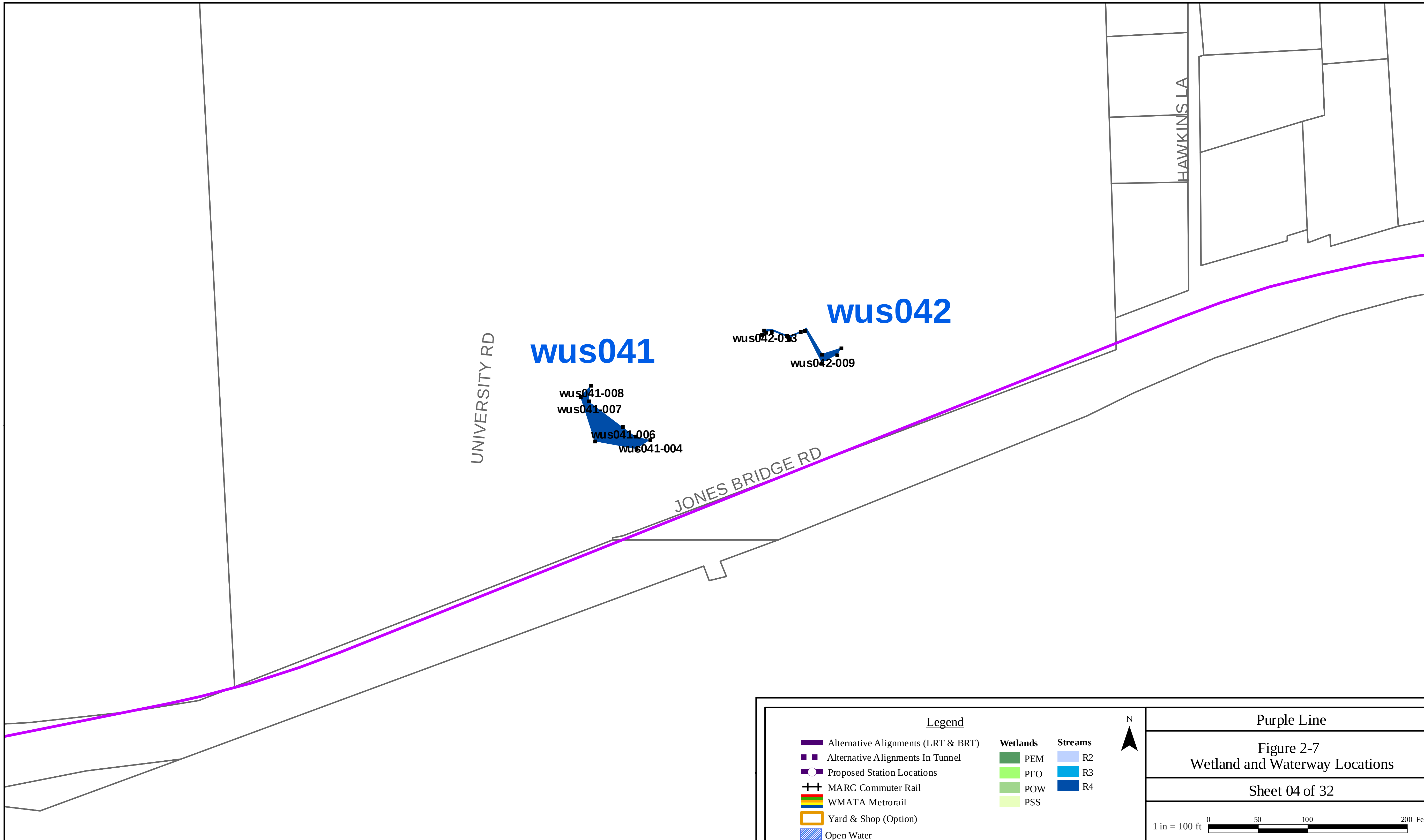
Sheet 02 of 32



Purple Line

Figure 2-7
Wetland and Waterway Locations

Sheet 03 of 32



Purple Line

Figure 2-7
Wetland and Waterway Locations

Sheet 04 of 32

Legend

Alternative Alignments (LRT & BRT)
Alternative Alignments In Tunnel
Proposed Station Locations
MARC Commuter Rail
WMATA Metrorail
Yard & Shop (Option)
Open Water

Wetlands: PEM, PFO, POW, PSS

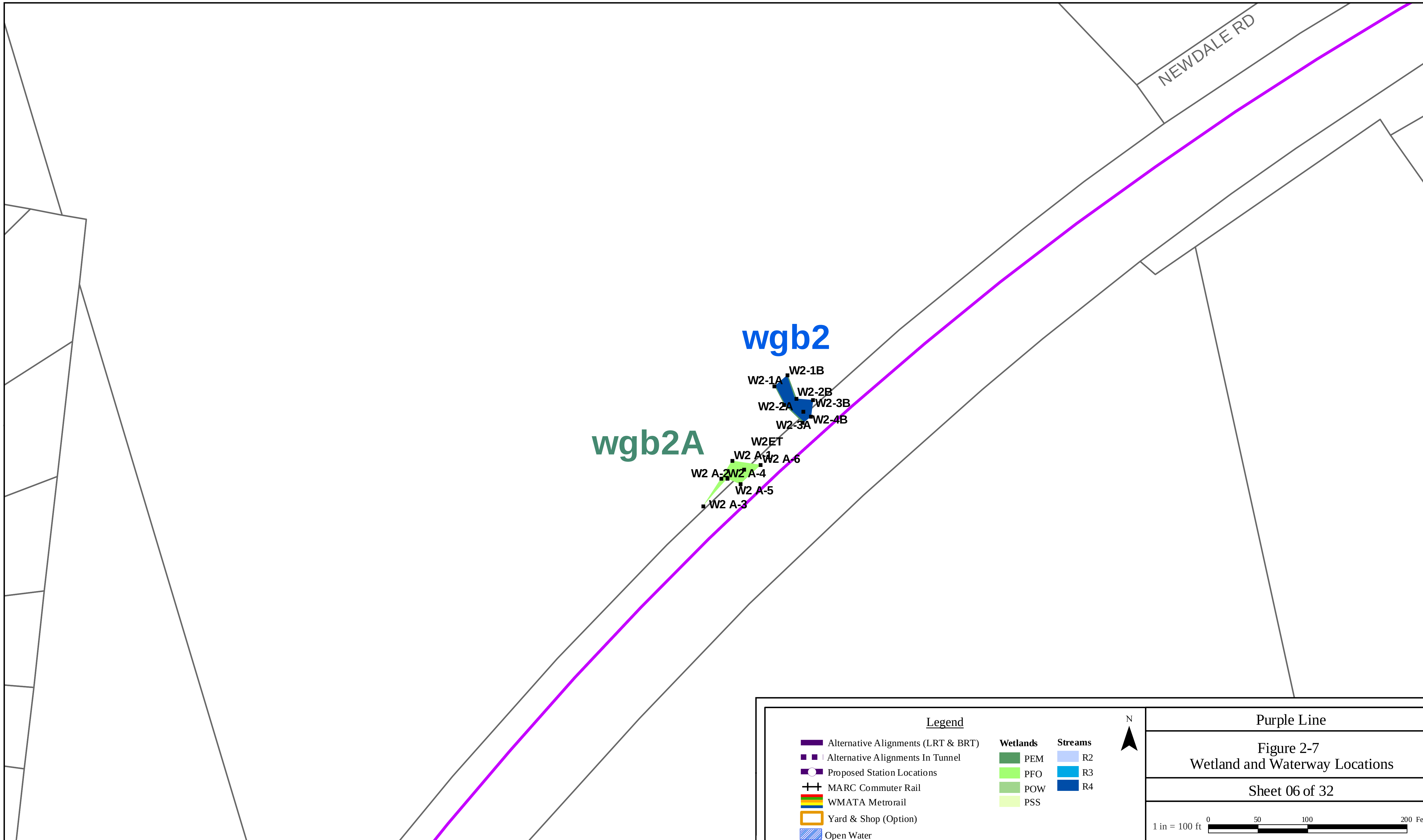
Streams: R2, R3, R4

Purple Line

Figure 2-7
Wetland and Waterway Locations

Sheet 05 of 32

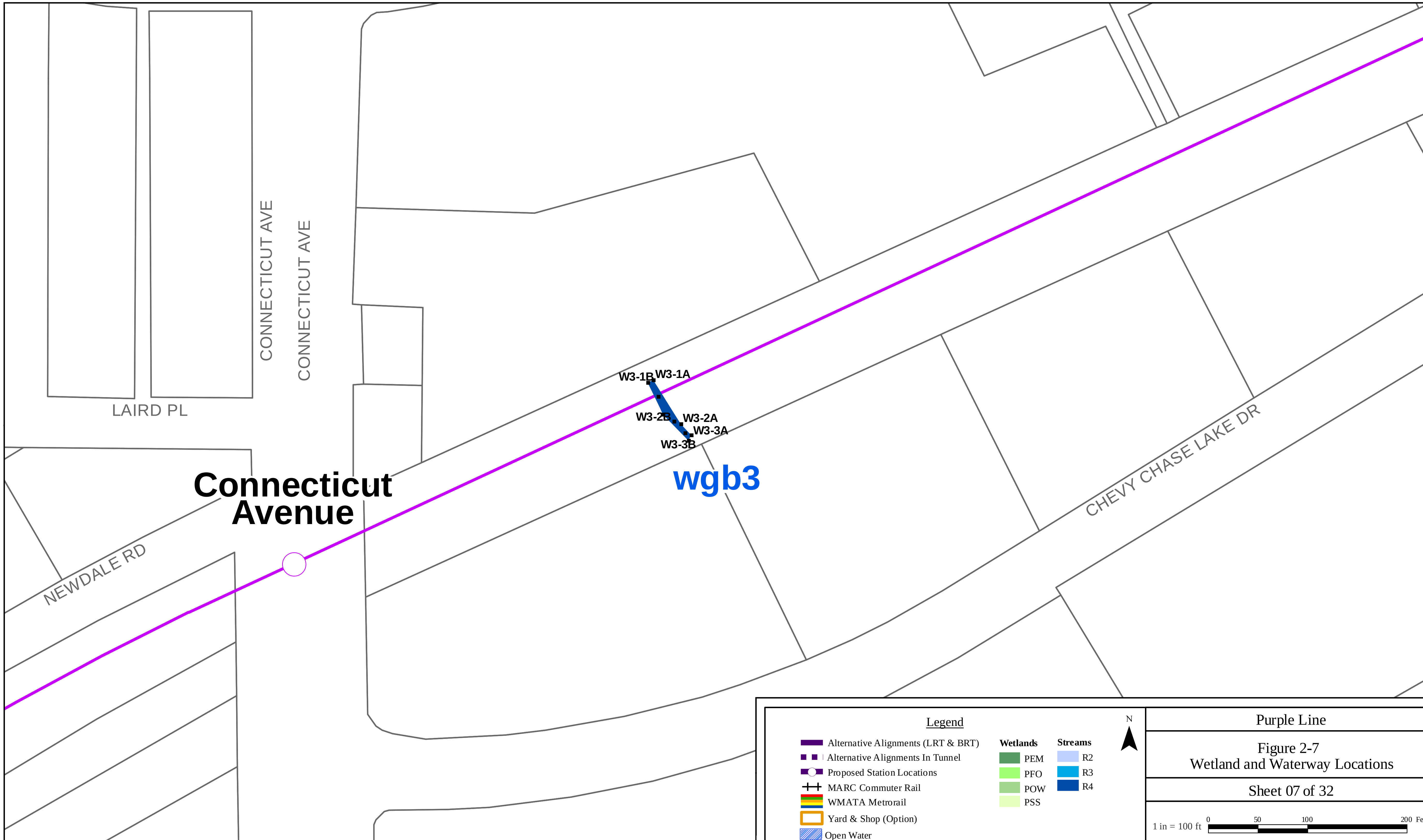
1 in = 100 ft — 0, 50, 100, 200 Feet

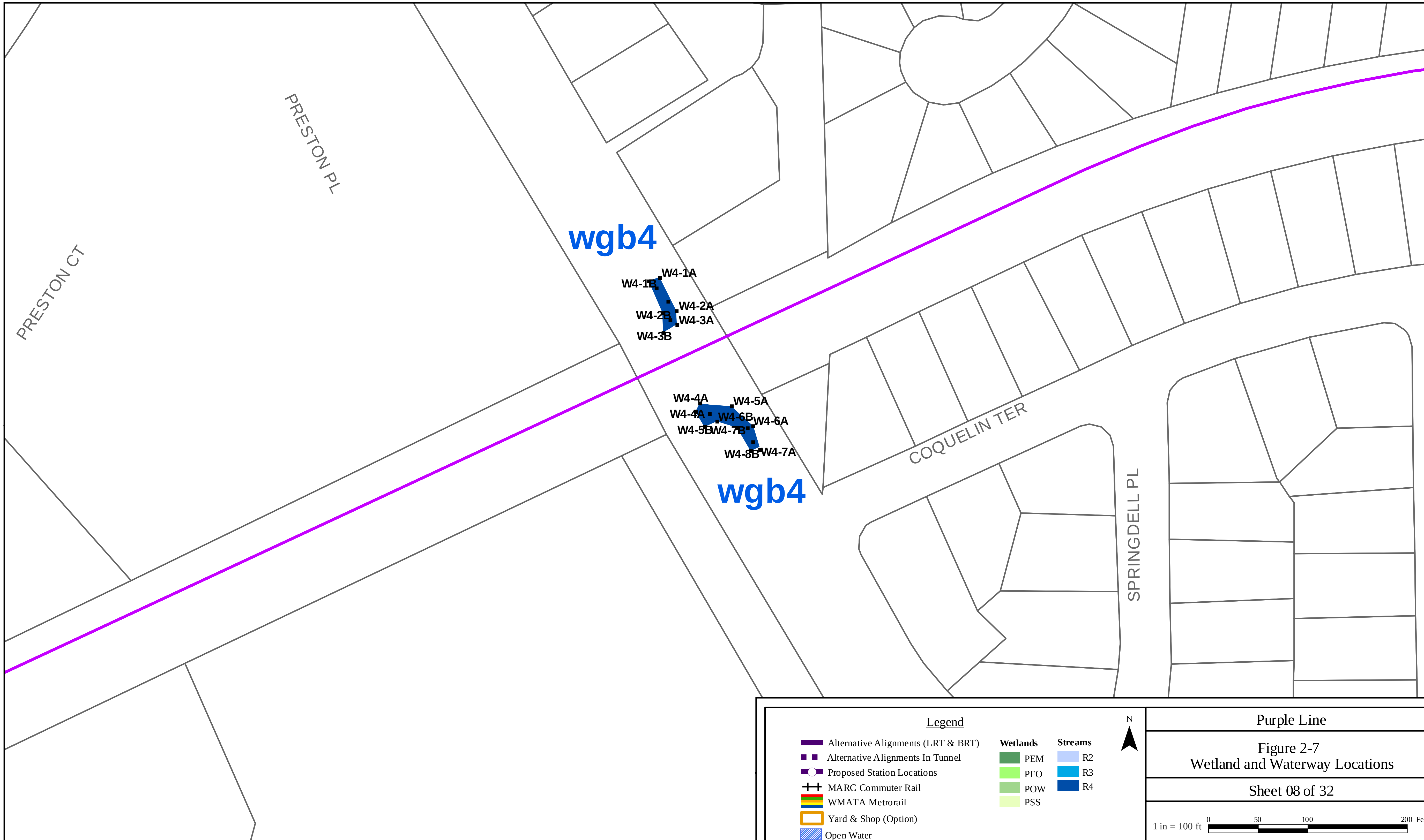


Purple Line

Figure 2-7
Wetland and Waterway Locations

Sheet 06 of 32

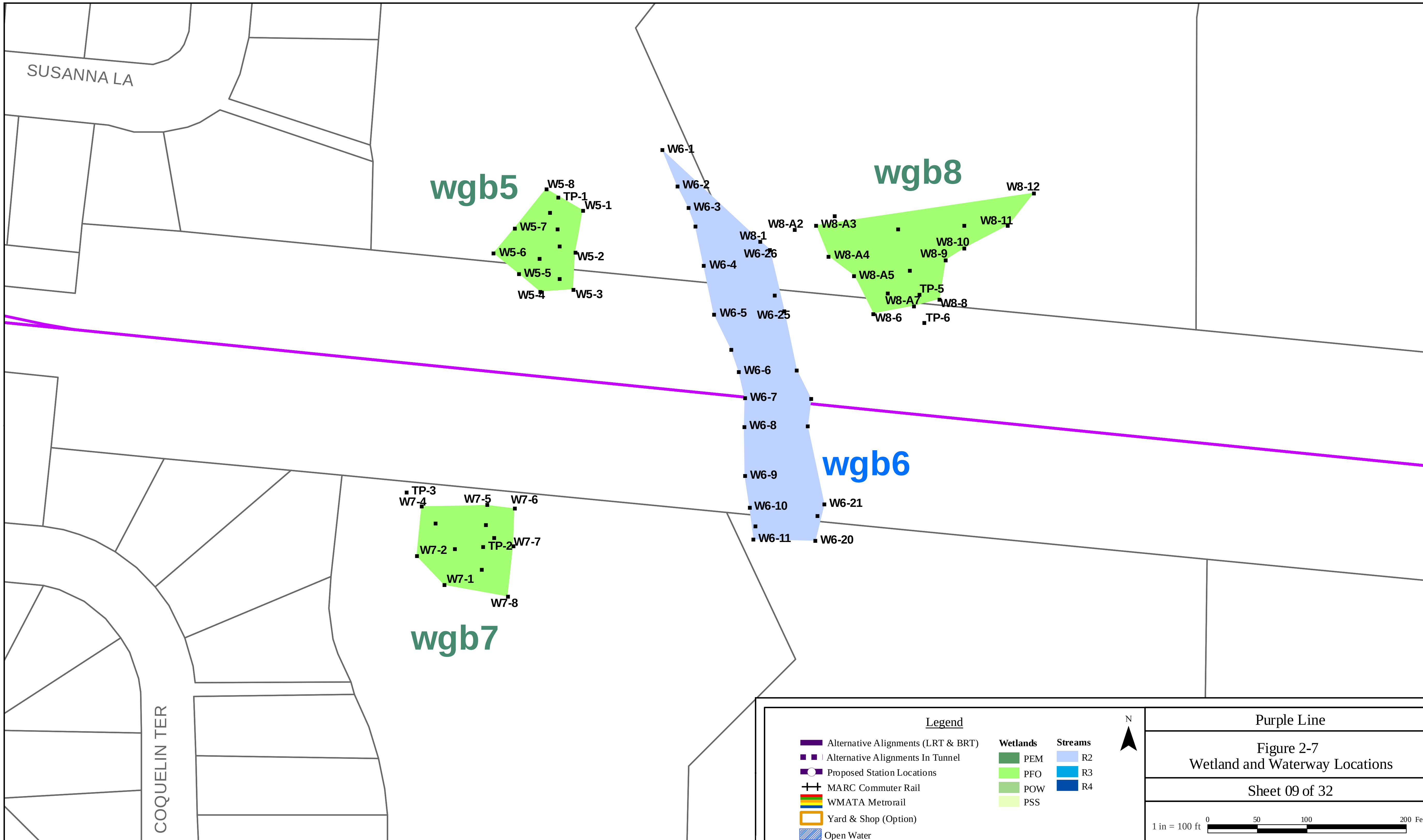

CONNECTICUT AVE
CONNECTICUT AVE
LAIRD PL
Connecticut Avenue
NEWDALE RD
W3-1B
W3-1A
W3-2B
W3-2A
W3-3A
W3-3B
wgb3
CHEVY CHASE LAKE DR
Legend
Alternative Alignments (LRT & BRT)
Alternative Alignments In Tunnel
Proposed Station Locations
MARC Commuter Rail
WMATA Metrorail
Yard & Shop (Option)
Open Water
Wetlands
PEM
PFO
POW
PSS
Streams
R2
R3
R4
N
Purple Line
Figure 2-7
Wetland and Waterway Locations
Sheet 07 of 32
1 in = 100 ft
0 50 100 200 Feet

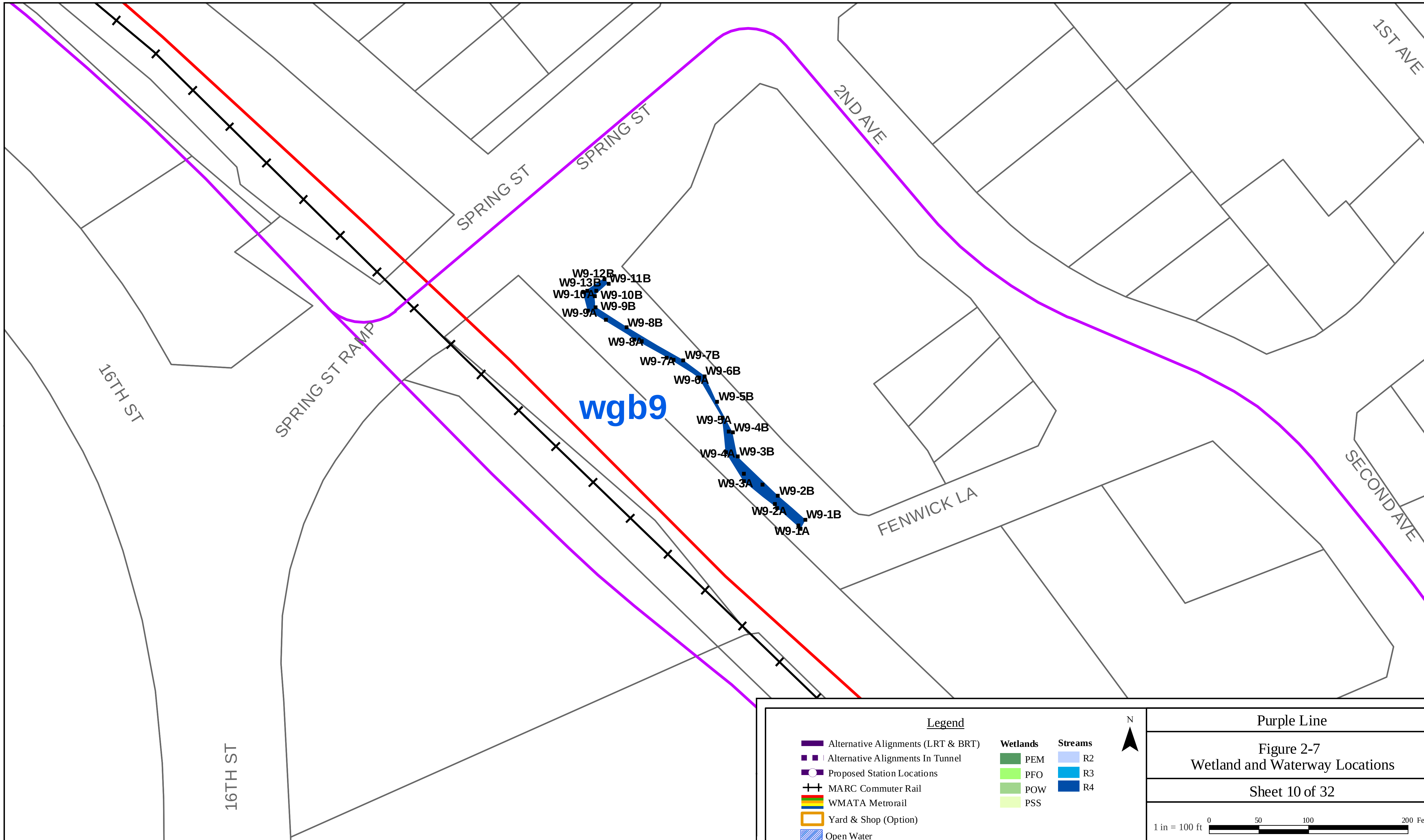


Purple Line

Figure 2-7
Wetland and Waterway Locations

Sheet 08 of 32

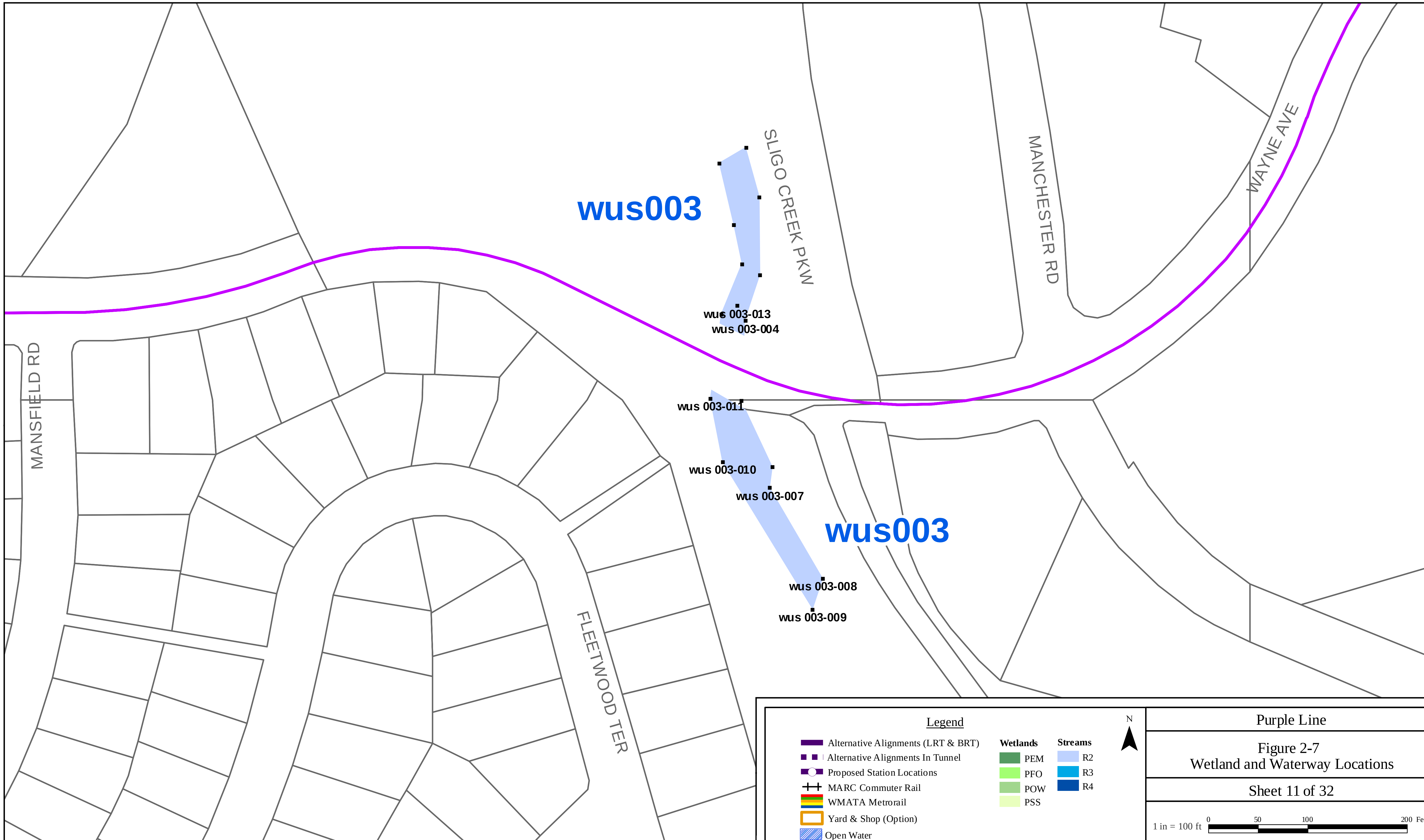

SUSANNA LA
COQUELIN TER
wgb5
wgb6
wgb7
wgb8
W5-1
W5-2
W5-3
W5-4
W5-5
W5-6
W5-7
W5-8
TP-1
W6-1
W6-2
W6-3
W6-4
W6-5
W6-6
W6-7
W6-8
W6-9
W6-10
W6-11
W6-20
W6-21
W6-25
W6-26
W7-1
W7-2
W7-4
W7-5
W7-6
W7-7
W7-8
TP-2
TP-3
W8-1
W8-6
W8-8
W8-9
W8-10
W8-11
W8-12
W8-A2
W8-A3
W8-A4
W8-A5
W8-A7
TP-5
TP-6
Legend
Alternative Alignments (LRT & BRT)
Alternative Alignments In Tunnel
Proposed Station Locations
MARC Commuter Rail
WMATA Metrorail
Yard & Shop (Option)
Open Water
Wetlands
PEM
PFO
POW
PSS
Streams
R2
R3
R4
N
Purple Line
Figure 2-7
Wetland and Waterway Locations
Sheet 09 of 32
1 in = 100 ft
0
50
100
200 Feet



Purple Line

Figure 2-7
Wetland and Waterway Locations

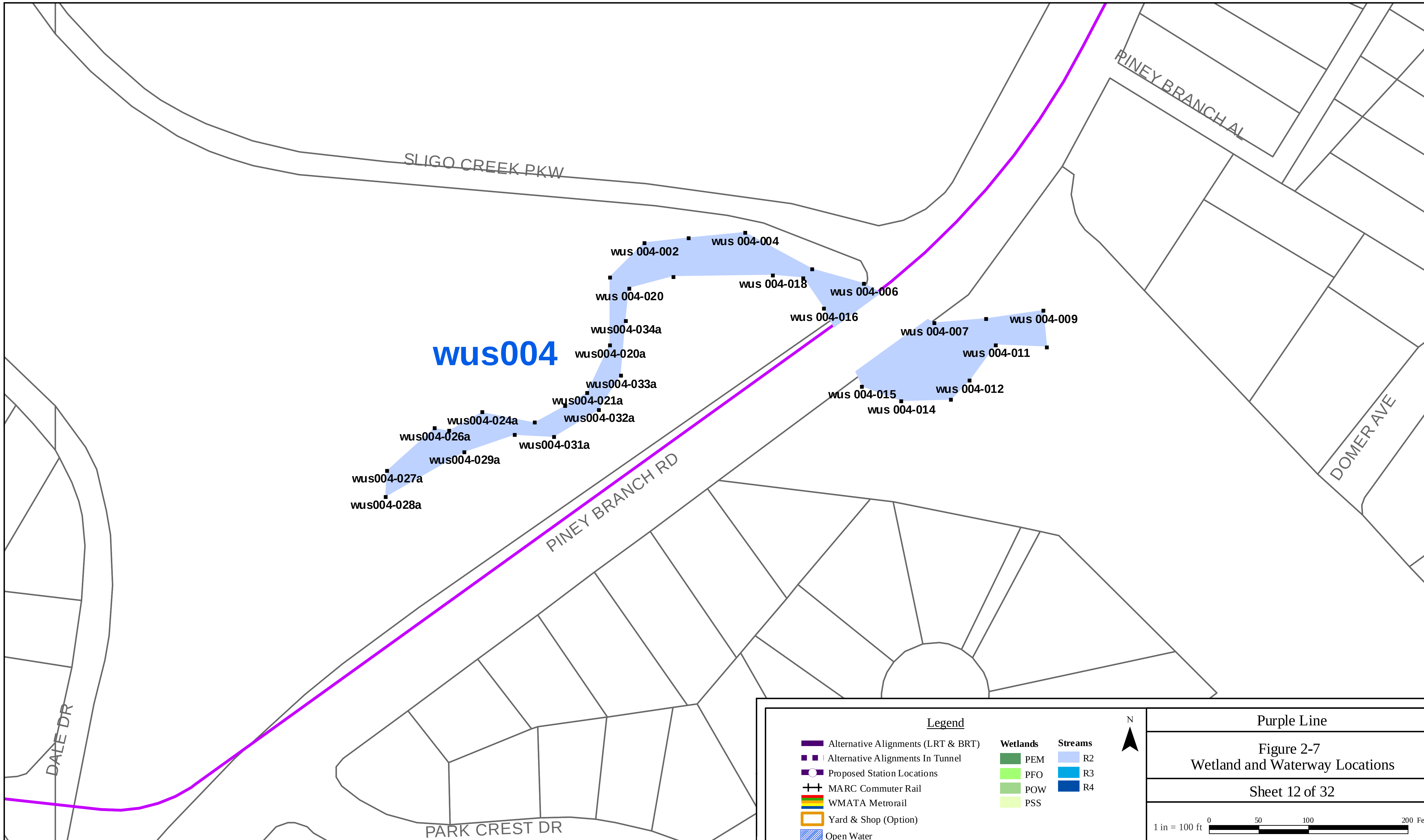
Sheet 10 of 32



Purple Line

Figure 2-7
Wetland and Waterway Locations

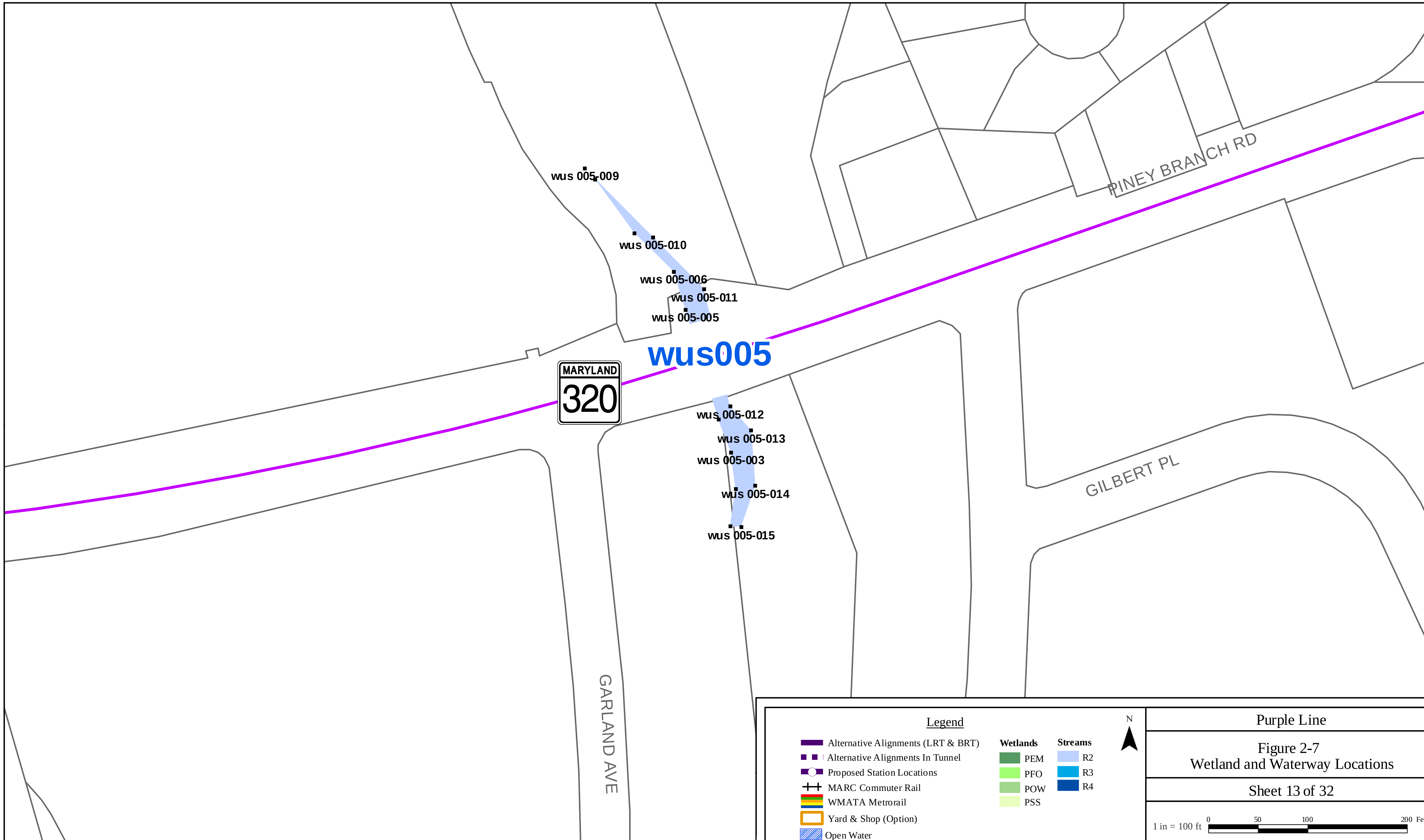
Sheet 11 of 32



Purple Line

Figure 2-7
Wetland and Waterway Locations

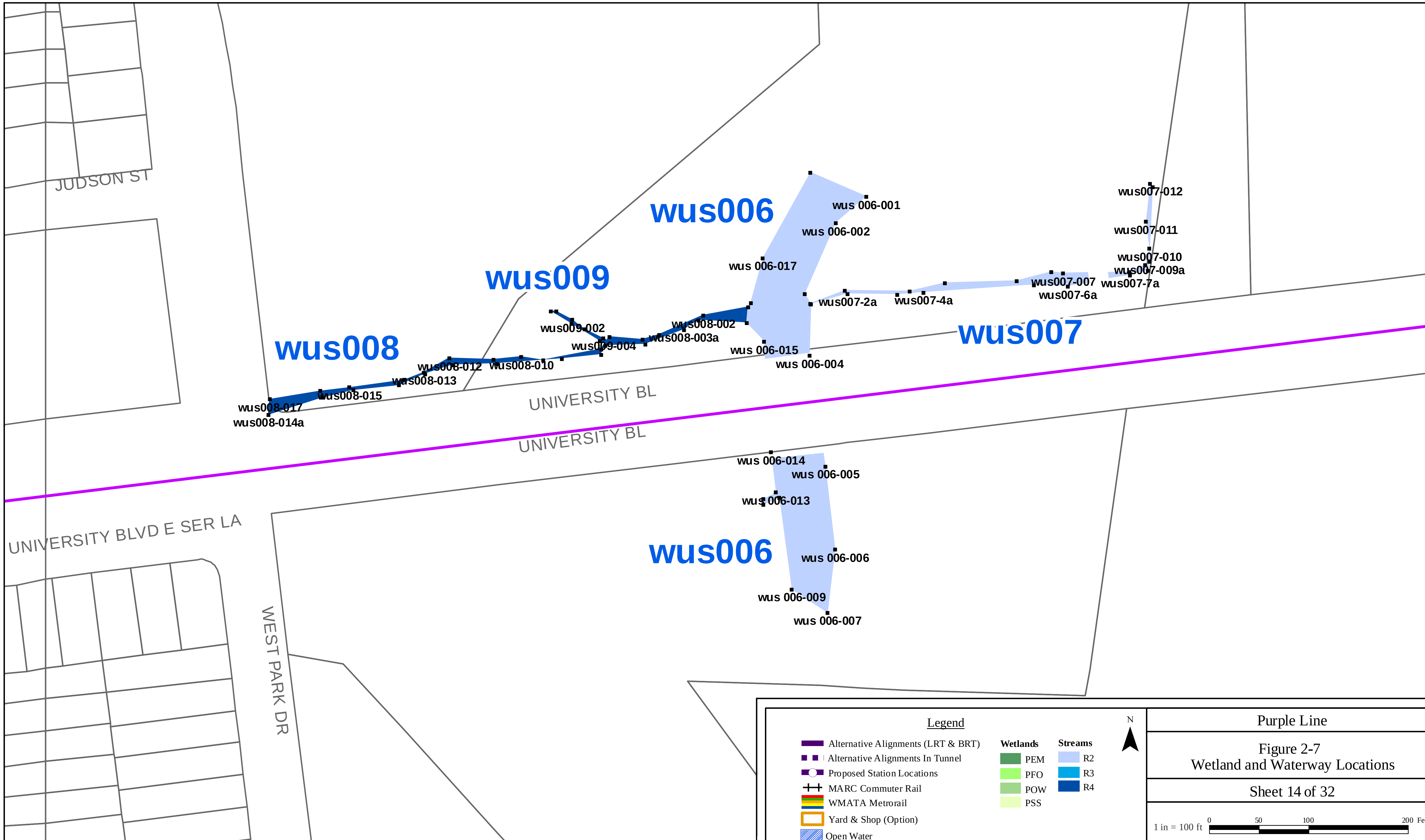
Sheet 12 of 32



Purple Line

Figure 2-7
Wetland and Waterway Locations

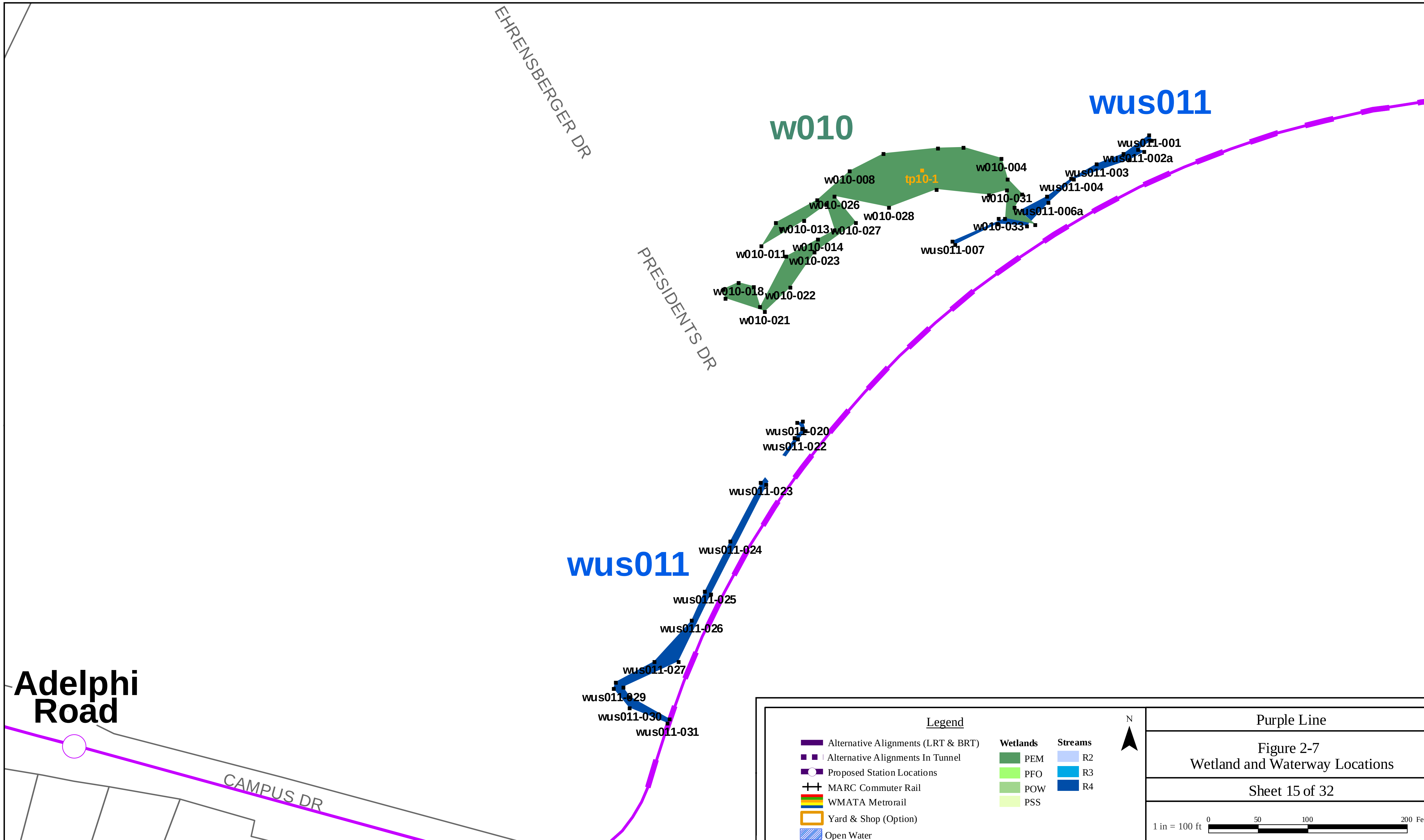
Sheet 13 of 32



Purple Line

Figure 2-7
Wetland and Waterway Locations

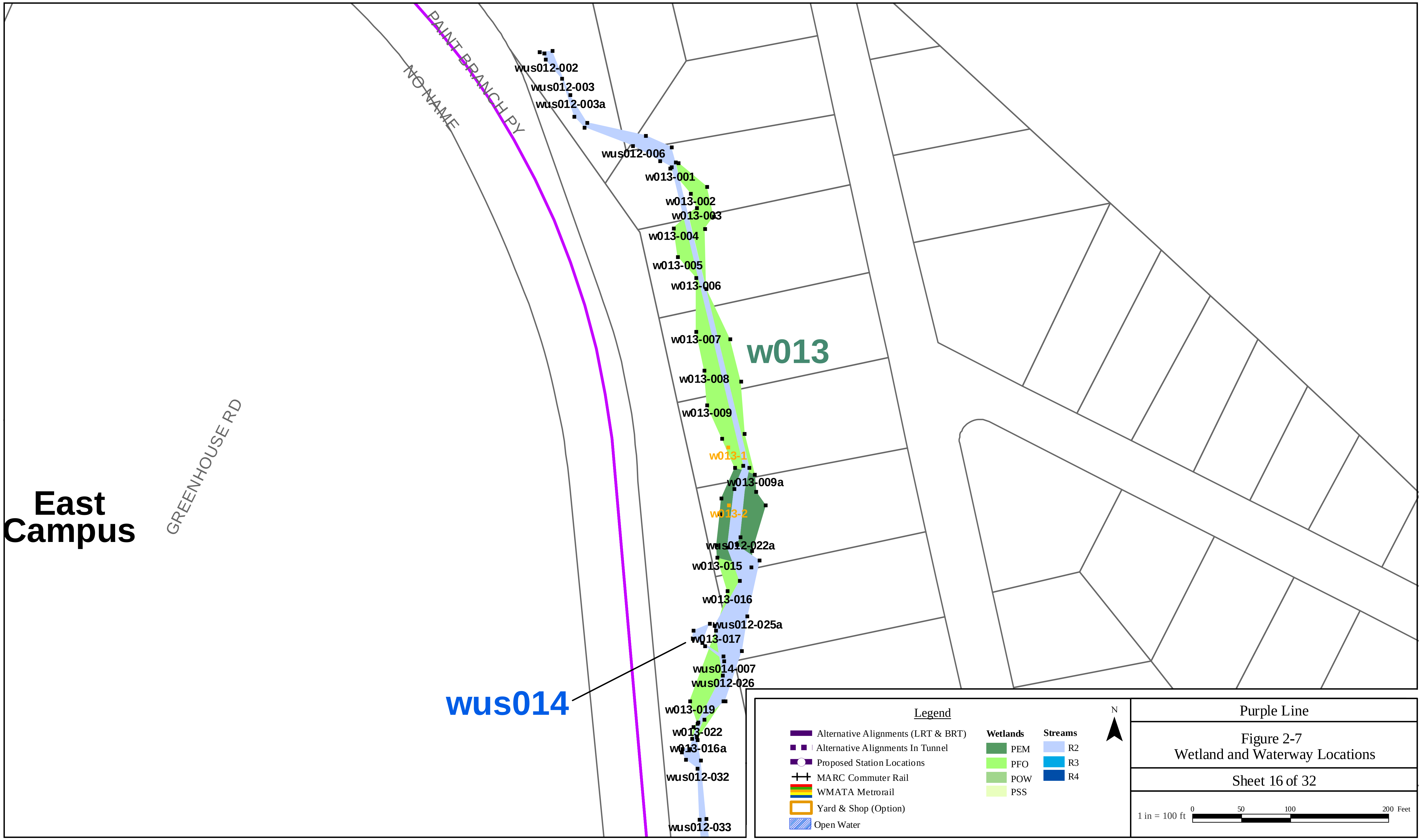
Sheet 14 of 32

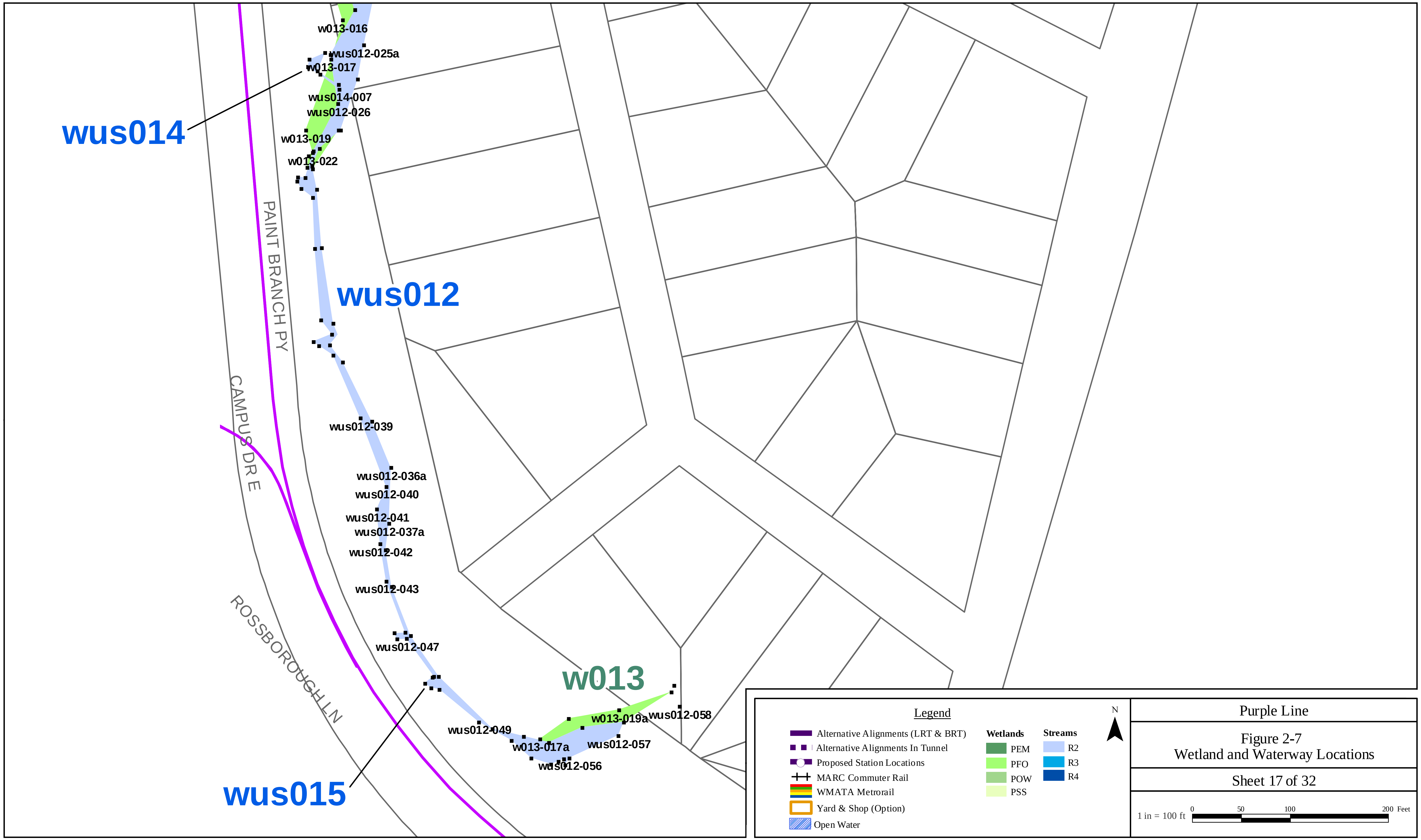


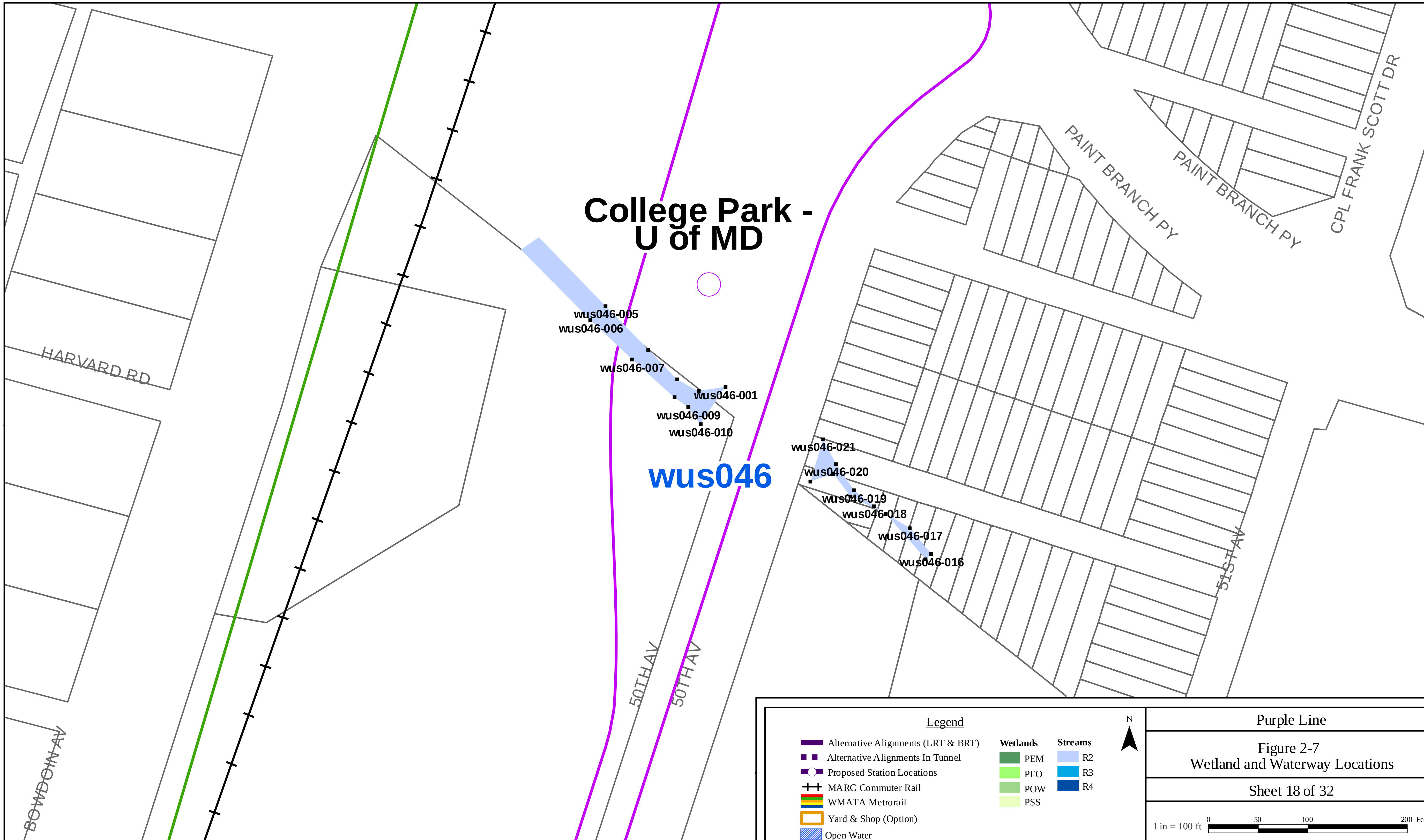
Purple Line

Figure 2-7
Wetland and Waterway Locations

Sheet 15 of 32


East Campus
GREENHOUSE RD
NO NAME
PAINT BRANCH PY
w013
wus014
wus012-002
wus012-003
wus012-003a
wus012-006
w013-001
w013-002
w013-003
w013-004
w013-005
w013-006
w013-007
w013-008
w013-009
w013-1
w013-009a
w013-2
wus012-022a
w013-015
w013-016
wus012-025a
w013-017
wus014-007
wus012-026
w013-019
w013-022
w013-016a
wus012-032
wus012-033
Legend
Alternative Alignments (LRT & BRT)
Alternative Alignments In Tunnel
Proposed Station Locations
MARC Commuter Rail
WMATA Metrorail
Yard & Shop (Option)
Open Water
Wetlands
PEM
PFO
POW
PSS
Streams
R2
R3
R4
N
Purple Line
Figure 2-7
Wetland and Waterway Locations
Sheet 16 of 32
1 in = 100 ft
0
50
100
200 Feet

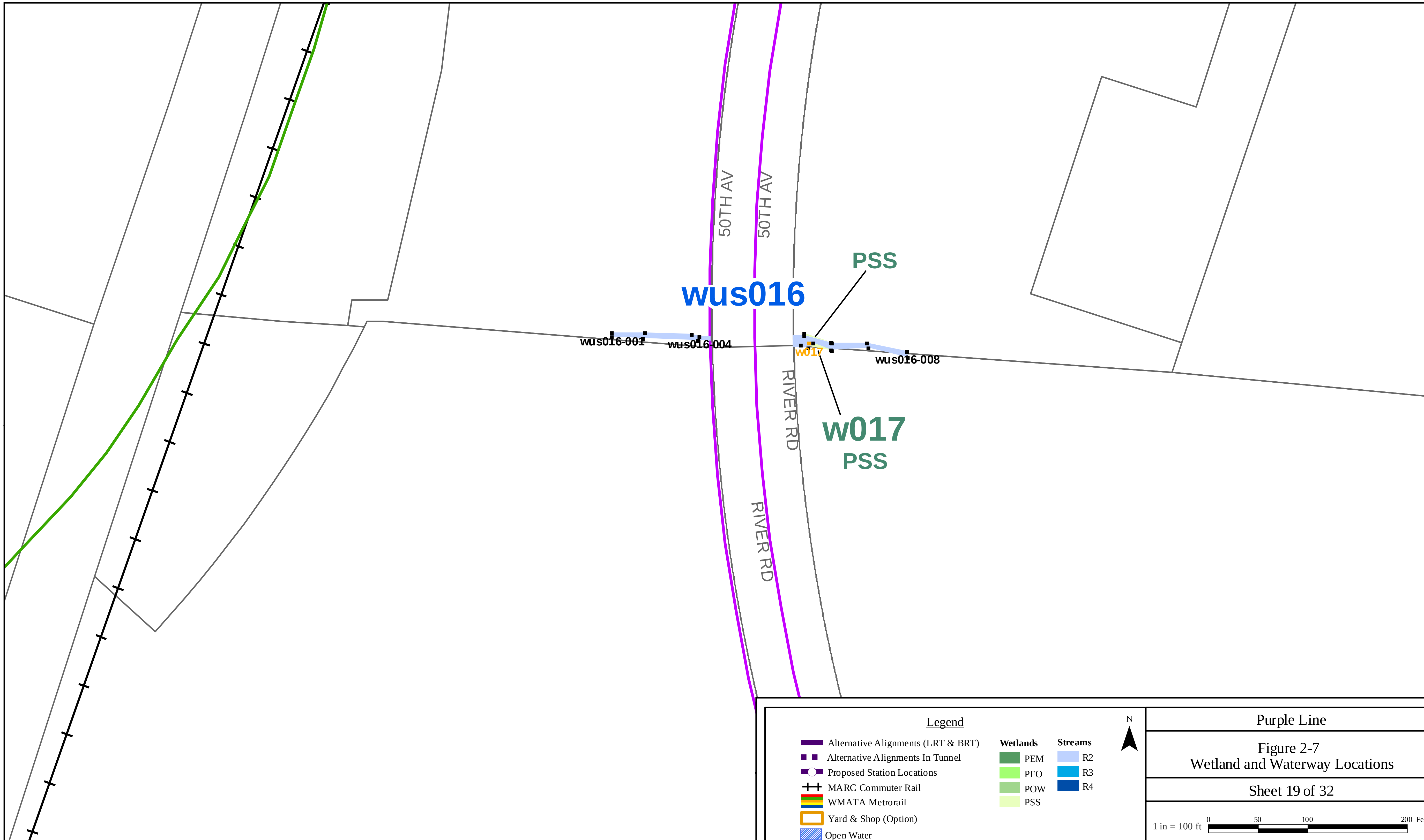

wus014
wus012
wus015
w013
w013-016
wus012-025a
w013-017
wus014-007
wus012-026
w013-019
w013-022
wus012-039
wus012-036a
wus012-040
wus012-041
wus012-037a
wus012-042
wus012-043
wus012-047
wus012-049
w013-017a
wus012-056
wus012-057
w013-019a
wus012-058
PAINT BRANCH PY
CAMPUS DR E
ROSSBOROUGH LN
Legend
Alternative Alignments (LRT & BRT)
Alternative Alignments In Tunnel
Proposed Station Locations
MARC Commuter Rail
WMATA Metrorail
Yard & Shop (Option)
Open Water
Wetlands
PEM
PFO
POW
PSS
Streams
R2
R3
R4
N
Purple Line
Figure 2-7
Wetland and Waterway Locations
Sheet 17 of 32
1 in = 100 ft
0
50
100
200 Feet



Purple Line

Figure 2-7
Wetland and Waterway Locations

Sheet 18 of 32

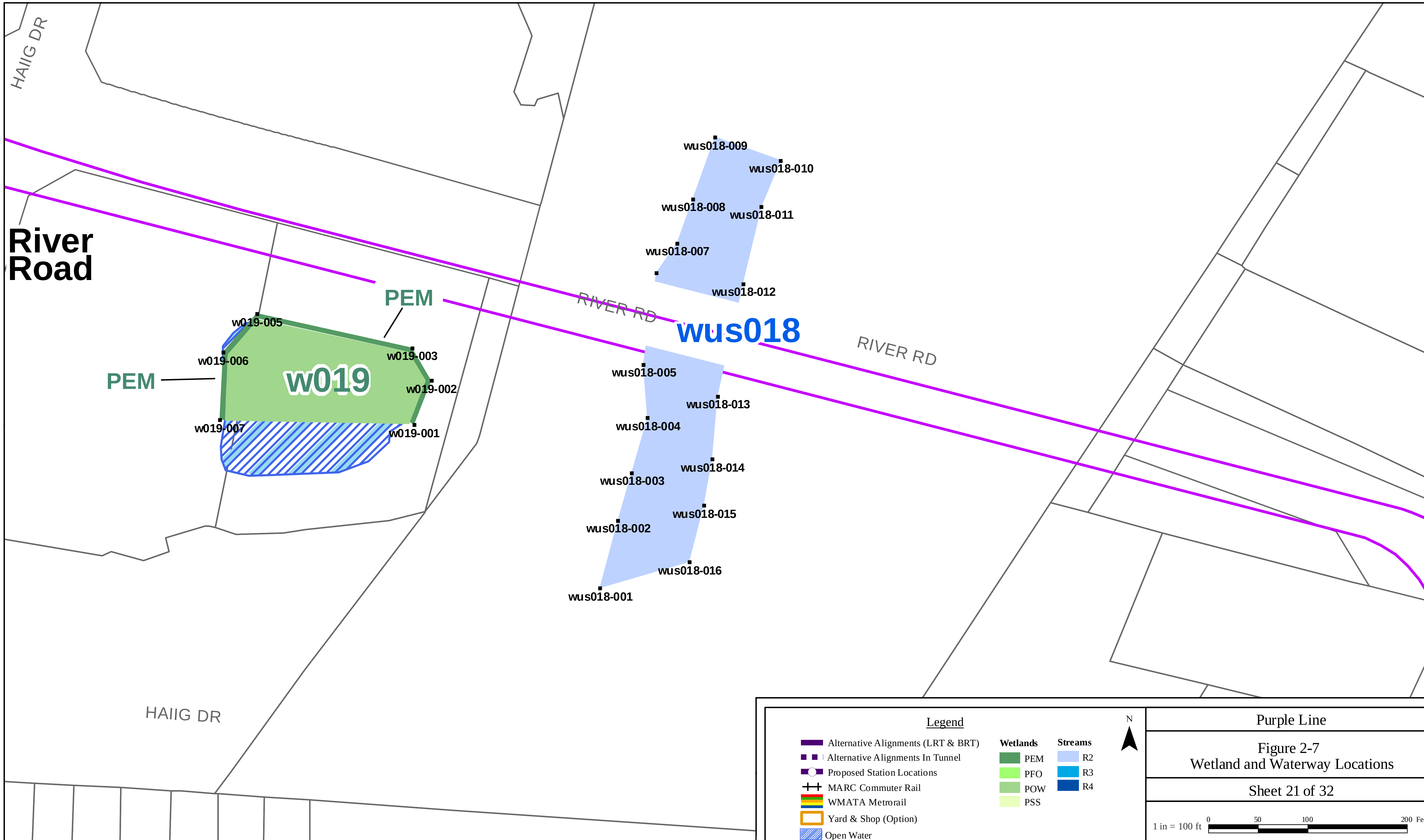


Purple Line

Figure 2-7
Wetland and Waterway Locations

Sheet 19 of 32

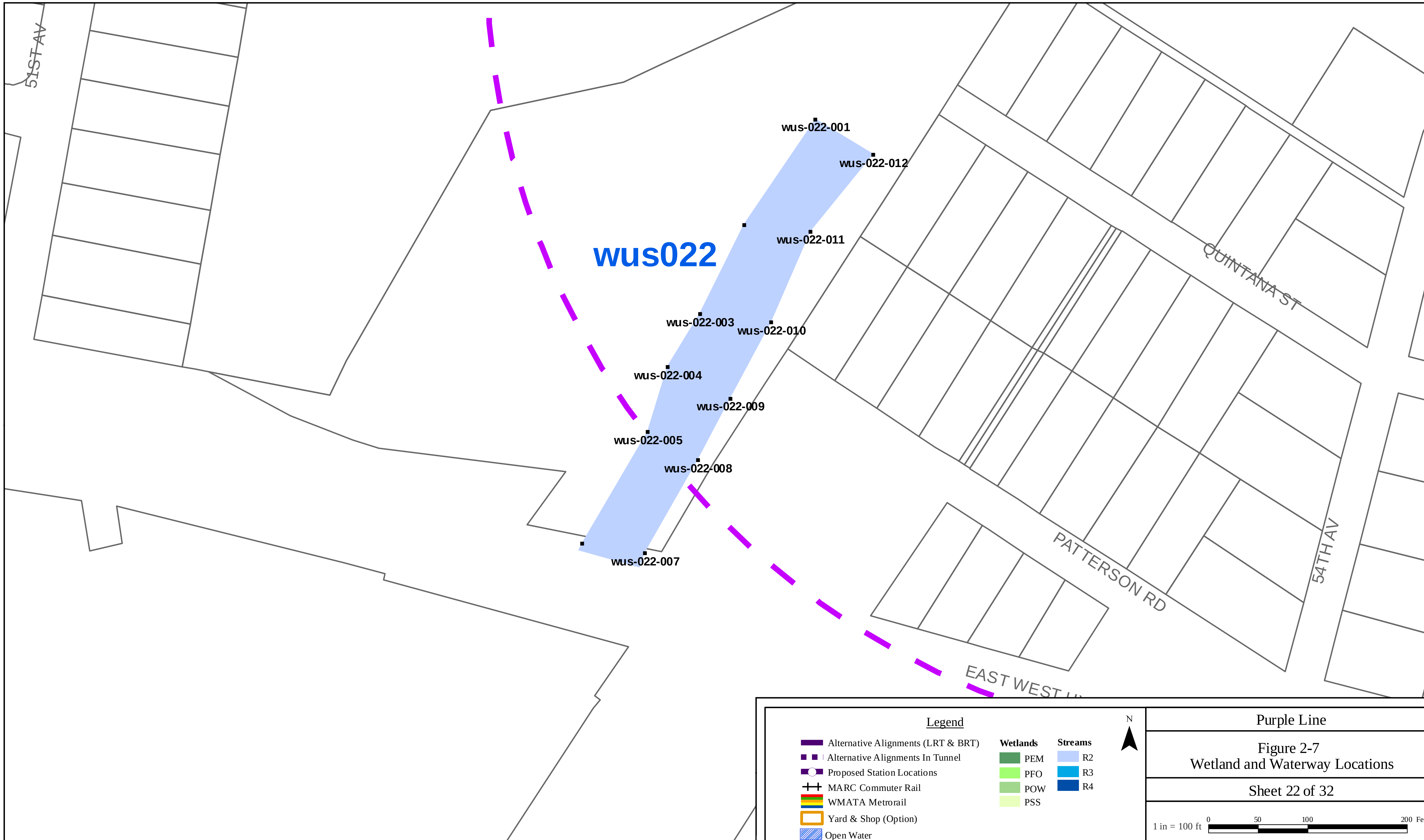

RIVERTECH CT
River Road
River Road
HAIG DR
w045
w045-001
w045-002
w045-003
w045-004
w045-005
w045-006
w045-007
w045-008
tp45-1
w021
w021-001
w021-002
w021-004
wus020
wus020-003
wus020-009
wus020-013
TUCKERMAN ST
51ST AV
Legend
Alternative Alignments (LRT & BRT)
Alternative Alignments In Tunnel
Proposed Station Locations
MARC Commuter Rail
WMATA Metrorail
Yard & Shop (Option)
Open Water
Wetlands
PEM
PFO
POW
PSS
Streams
R2
R3
R4
N
Purple Line
Figure 2-7
Wetland and Waterway Locations
Sheet 20 of 32
1 in = 100 ft
0
50
100
200 Feet



Purple Line

Figure 2-7
Wetland and Waterway Locations

Sheet 21 of 32



Purple Line

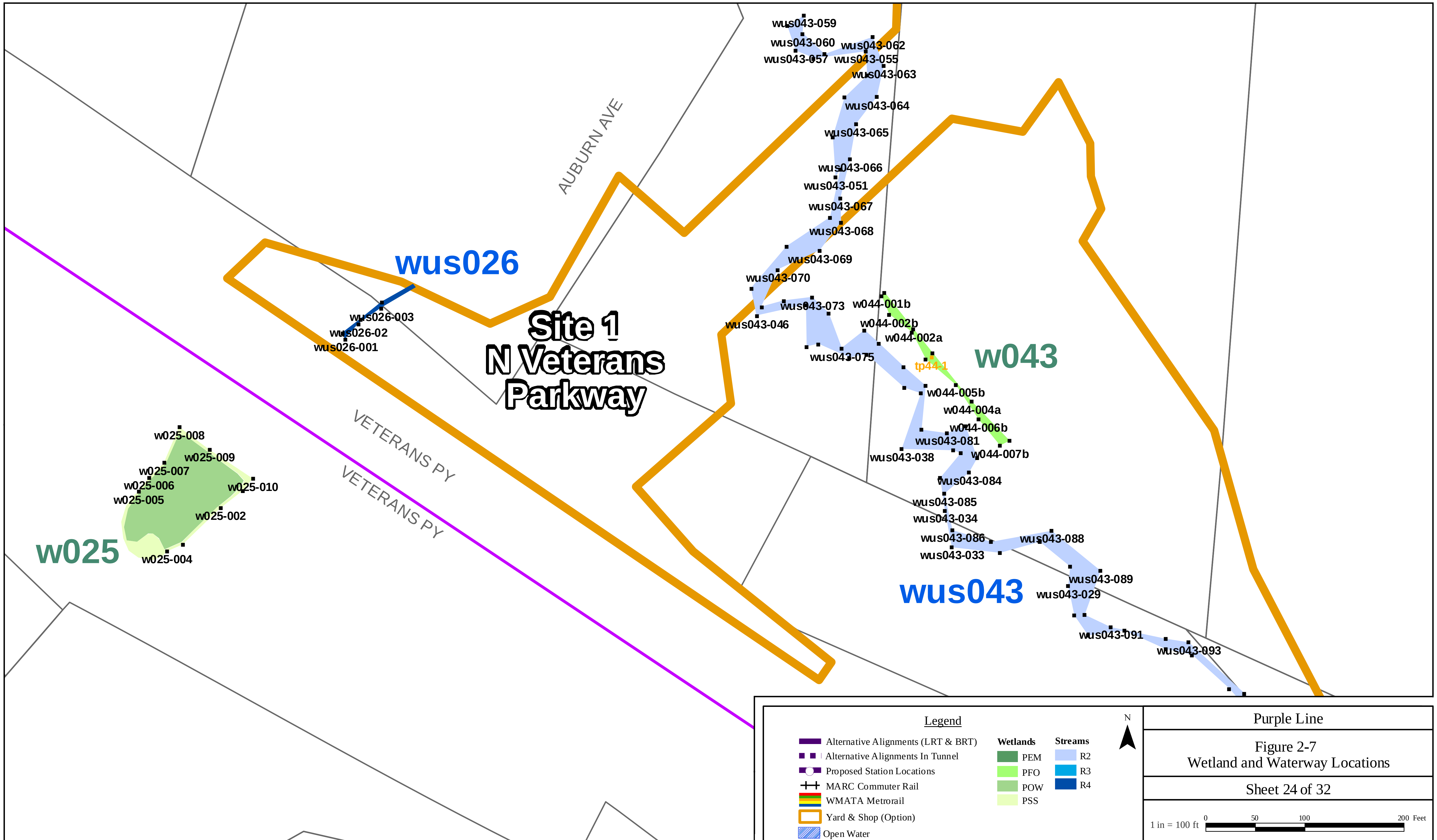
Figure 2-7
Wetland and Waterway Locations

Sheet 22 of 32

Purple Line

Figure 2-7
Wetland and Waterway Locations

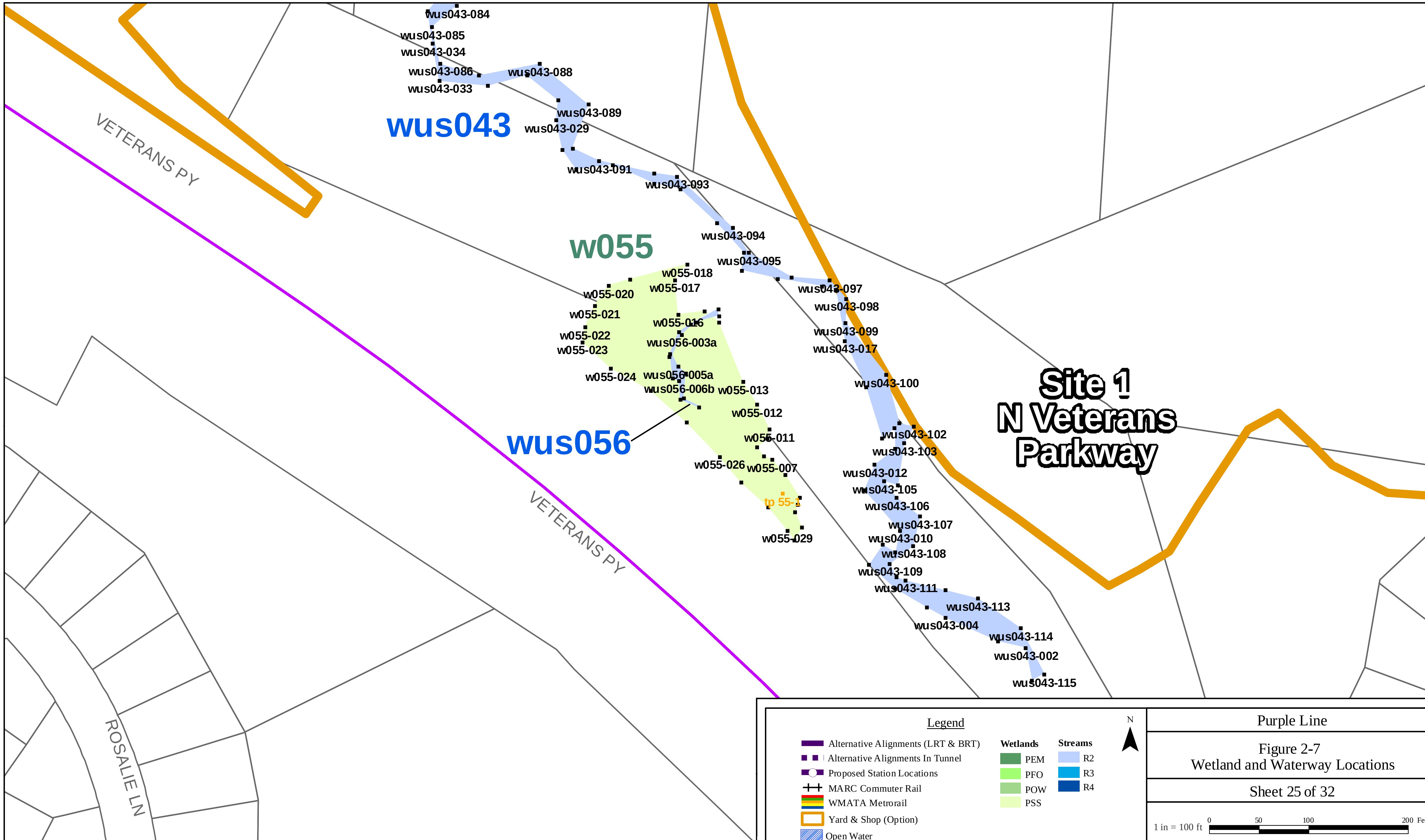
Sheet 23 of 32



Purple Line

Figure 2-7
Wetland and Waterway Locations

Sheet 24 of 32



Legend

- Alternative Alignments (LRT & BRT)
- Alternative Alignments In Tunnel
- Proposed Station Locations
- MARC Commuter Rail
- WMATA Metrorail
- Yard & Shop (Option)
- Open Water

Wetlands
- PEM
- PFO
- POW
- PSS

Streams
- R2
- R3
- R4

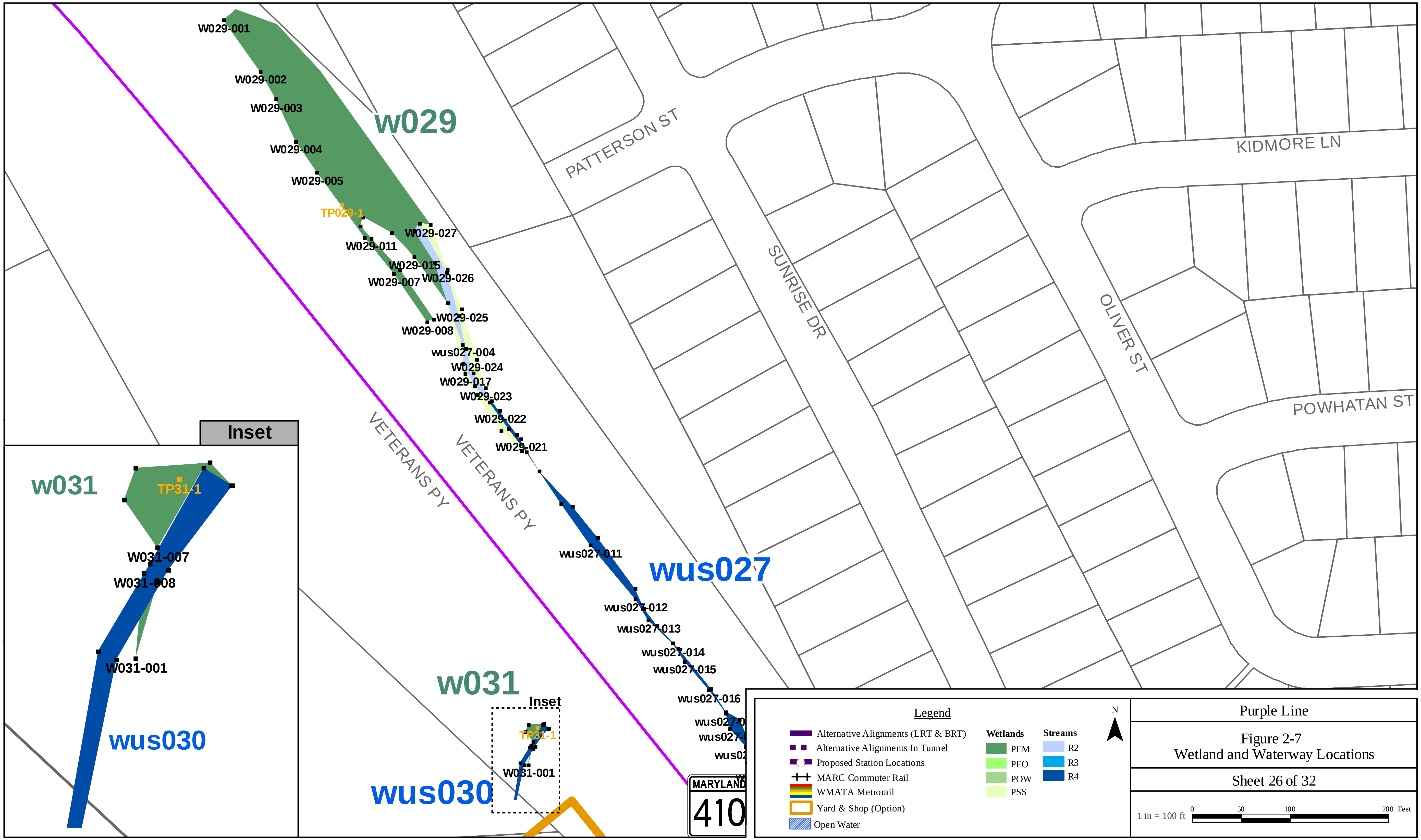
N

Purple Line

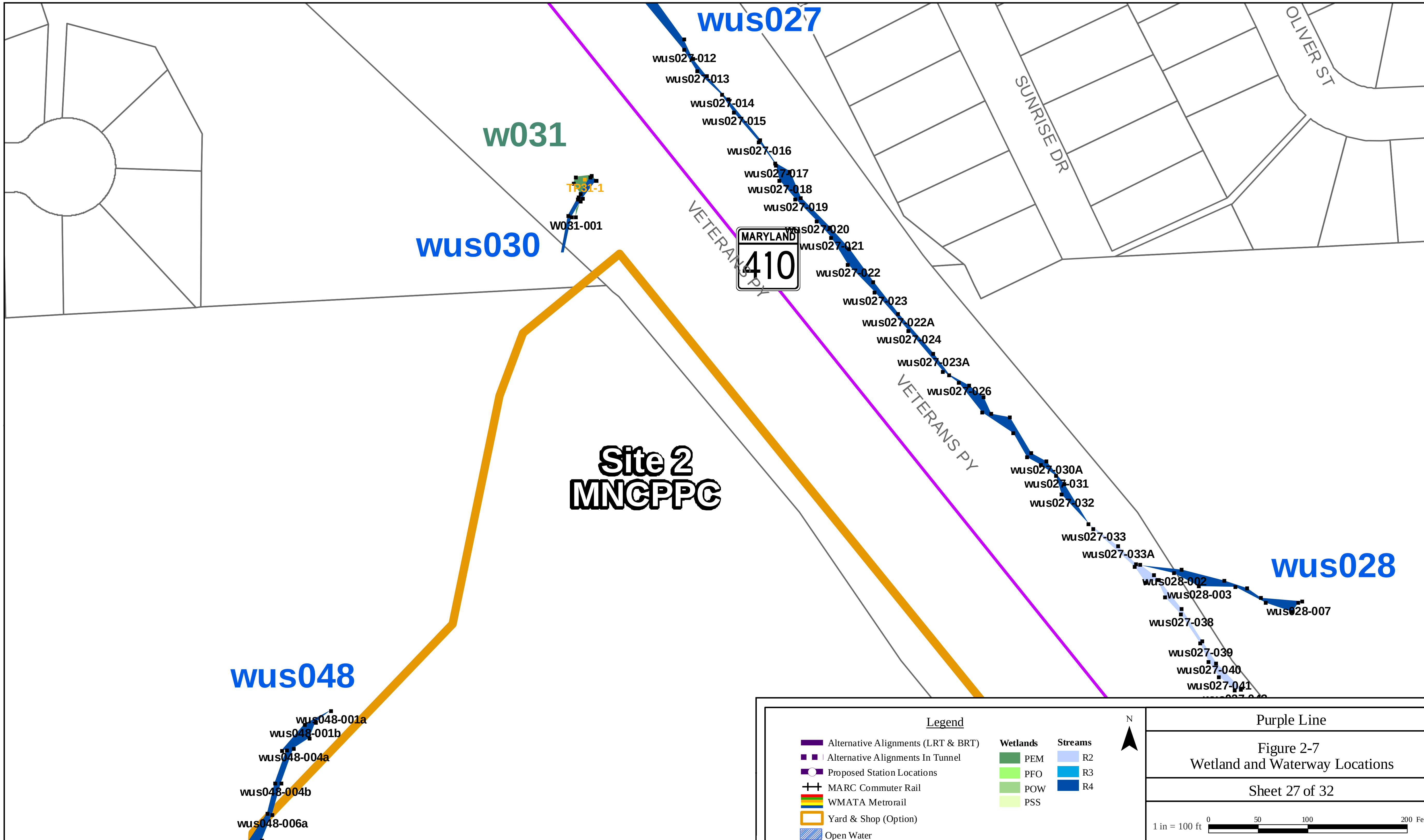
Figure 2-7
Wetland and Waterway Locations

Sheet 25 of 32

1 in = 100 ft 0 50 100 200 Feet



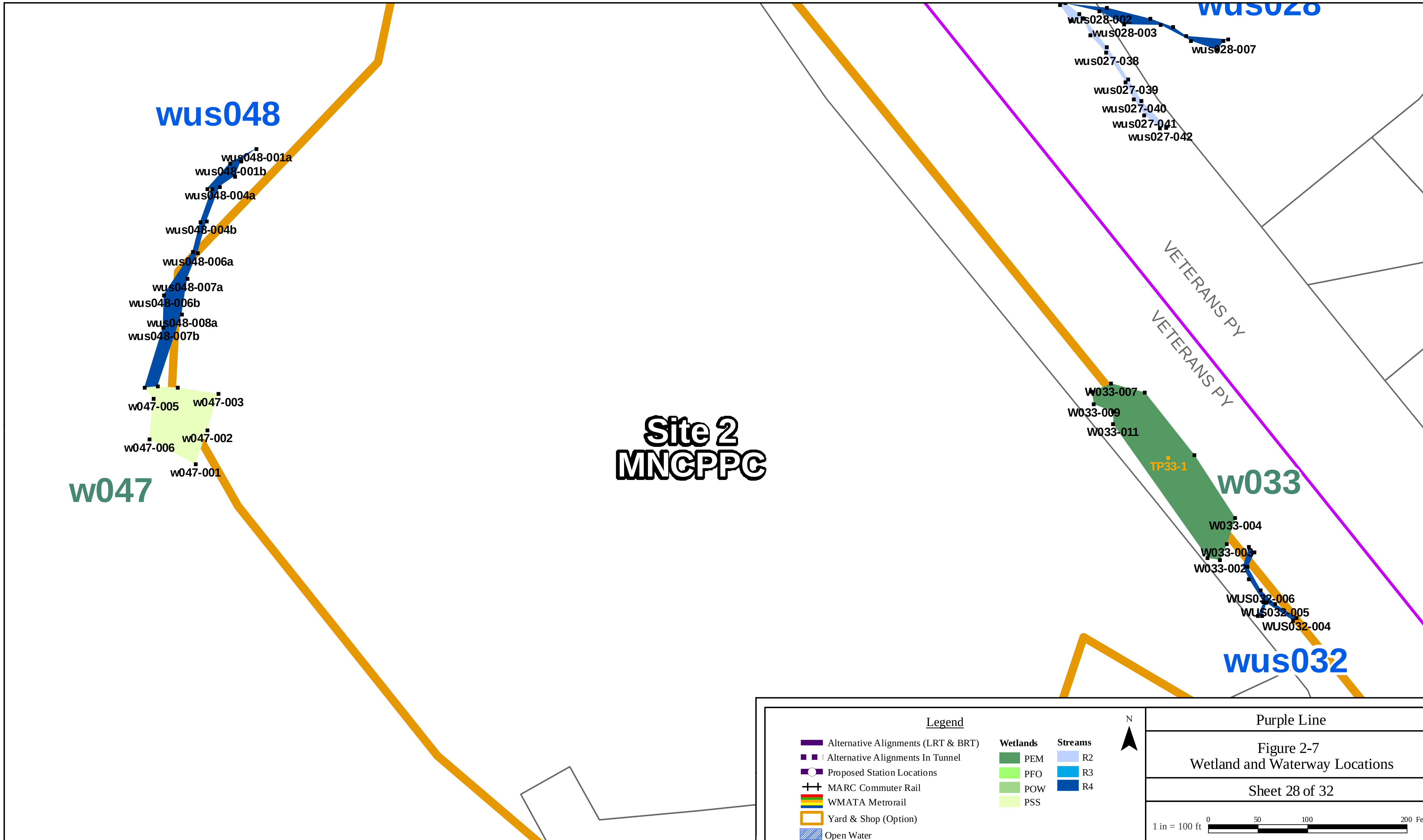
w029
W029-001
W029-002
W029-003
W029-004
W029-005
TP029-1
W029-011
W029-027
W029-015
W029-007
W029-026
W029-025
W029-008
wus027-004
W029-024
W029-017
W029-023
W029-022
W029-021
wus027-011
wus027
wus027-012
wus027-013
wus027-014
wus027-015
wus027-016
w031
Inset
TP31-1
W031-001
wus030
W031-007
W031-008
VETERANS PY
VETERANS PY
PATTERSON ST
SUNRISE DR
OLIVER ST
KIDMORE LN
POWHATAN ST
MARYLAND
410
Legend
Alternative Alignments (LRT & BRT)
Alternative Alignments In Tunnel
Proposed Station Locations
MARC Commuter Rail
WMATA Metrorail
Yard & Shop (Option)
Open Water
Wetlands
PEM
PFO
POW
PSS
Streams
R2
R3
R4
N
Purple Line
Figure 2-7
Wetland and Waterway Locations
Sheet 26 of 32
1 in = 100 ft
0
50
100
200
Feet



Purple Line

Figure 2-7
Wetland and Waterway Locations

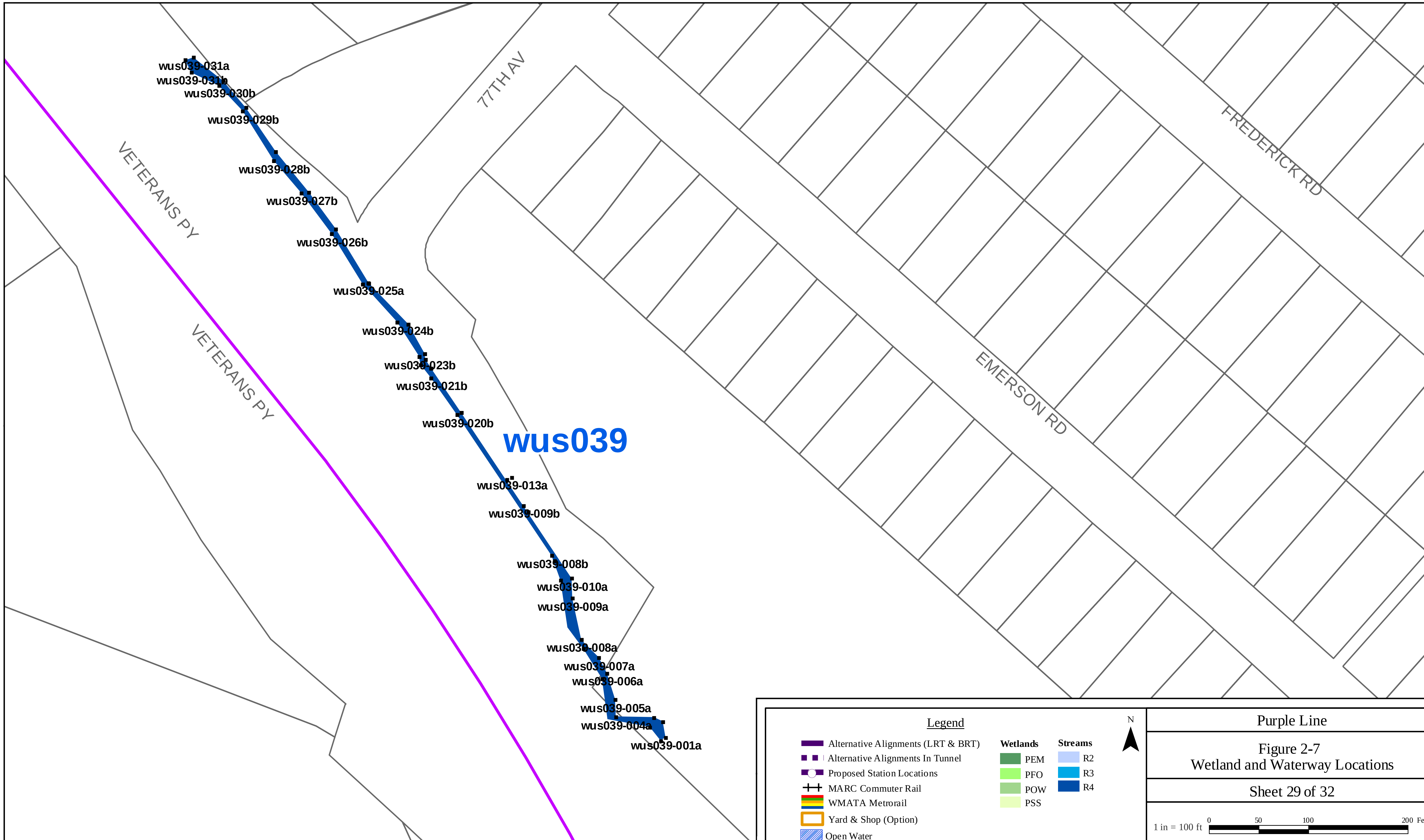
Sheet 27 of 32



Purple Line

Figure 2-7
Wetland and Waterway Locations

Sheet 28 of 32



Legend

Alternative Alignments (LRT & BRT)
Alternative Alignments In Tunnel
Proposed Station Locations
MARC Commuter Rail
WMATA Metrorail
Yard & Shop (Option)
Open Water

Wetlands
PEM
PFO
POW
PSS

Streams
R2
R3
R4

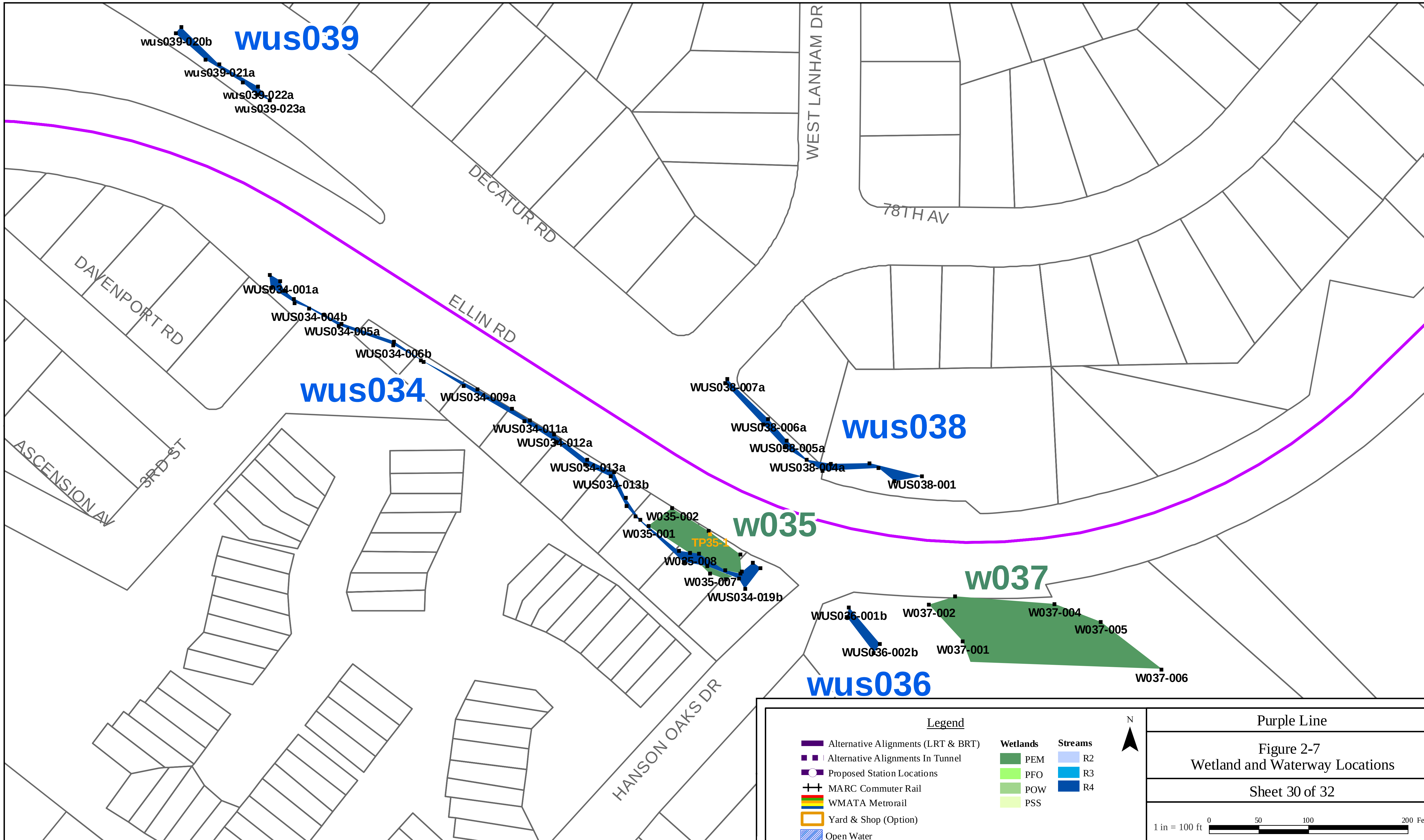
N

Purple Line

Figure 2-7
Wetland and Waterway Locations

Sheet 29 of 32

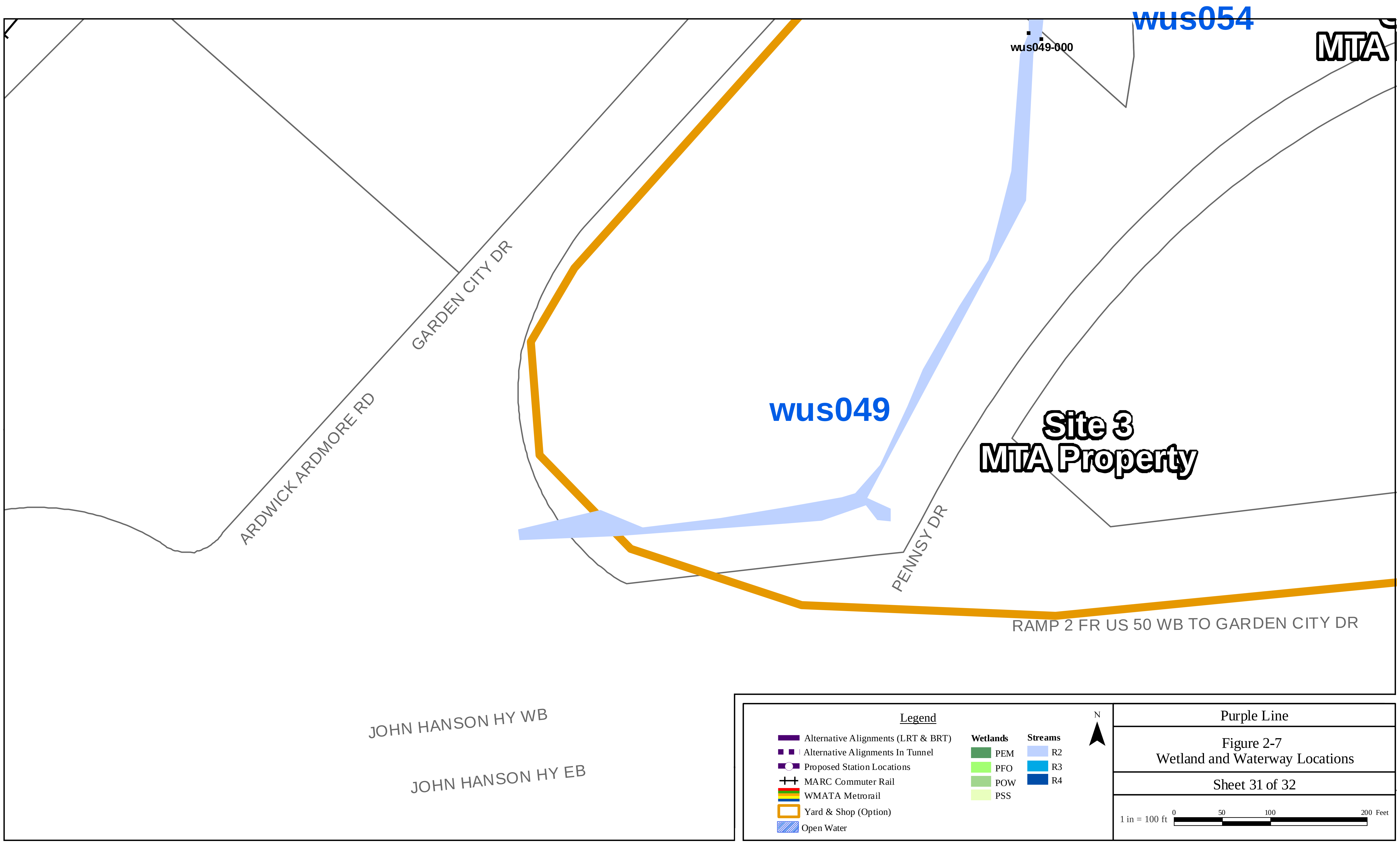
1 in = 100 ft 0 50 100 200 Feet



Purple Line

Figure 2-7
Wetland and Waterway Locations

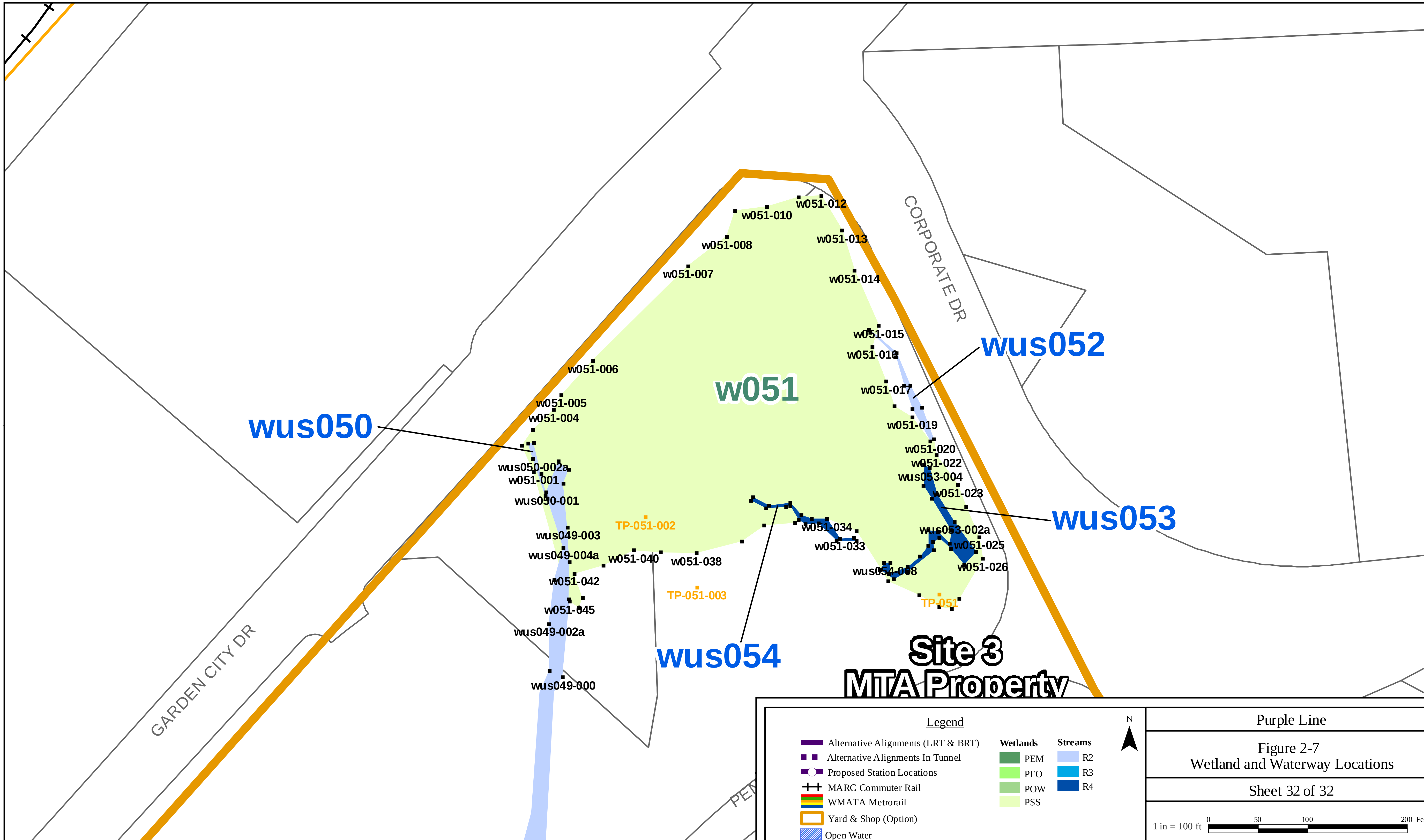
Sheet 30 of 32



Purple Line

Figure 2-7
Wetland and Waterway Locations

Sheet 31 of 32



Purple Line

Figure 2-7
Wetland and Waterway Locations

Sheet 32 of 32

Appendix F

Individual Numbered Wetland And Waterway Impacts for the Build Alternative and the Maintenance and Storage Facilities

Appendix F
Individual Wetland Impacts within the BRT and LRT Alternatives and Yard and Shop Sites

Wetland #	Cowardin Class.	Alt. 3	Alt.4	Alt 4. w/ Preinkert Drive	Alt.5	Alt. 5 w/ Thayer Option	Alt. 6	Alt. 7	Alt 7. w/ Preinkert Drive	Alt. 8	Alt. 8 w/ Thayer Option	Y&S #2	Y&S #3	Y&S #4
WGB-1	PEM		1527.22	1527.22	1527.22	1527.21	1514.95	1514.95	1514.95	1514.95	1514.95			
WGB-2	PEM		11.42	11.42	11.42	11.32	11.12	11.12	11.12	11.12	11.12			
WGB-2A	PFO		354.08	354.08	354.08	350.84	348.64	348.64	348.64	348.64	348.64			
WGB-5	PFO													
WGB-8	PFO													
W010	PEM	393.80	393.80		393.80	391.91	393.80	393.80	393.80	393.80	393.80			
W019	PEM						893.83	893.83	893.83					
W019	POW						1339.50	1339.50	1339.50					
W024	PEM						2.77	2.77	2.77	2.77	2.77			
W025	POW	7379.15	7379.15	7379.15	7379.15	7379.15	7379.15	7379.15	7379.15	7379.15	7379.15			
W025	PSS	1612.34	1612.34	1612.34	1612.34	1612.34	1612.34	1612.34	1612.34	1612.34	1612.34			
W029	PEM	16513.28	16513.28	16513.28	16513.28	16513.28	16513.28	16513.28	16513.28	16513.28	16513.28			
W029	PSS	1628.70	1628.70	1628.70	1628.70	1628.70	1628.70	1628.70	1628.70	1628.70	1628.70			
W031	PEM	186.58	186.58	186.58	186.58	186.58	186.58	186.58	186.58	186.58	186.58			
W033	PEM	8947.13	8947.13	8947.13	8947.13	8947.13	8947.13	8947.13	8947.13	8947.13	8947.13			
W035	PEM		2154.12	2154.12	2154.12	2154.12		2551.52	2551.52	2551.52	2551.52			
W037	PEM		859.85	859.85	859.85	859.85		8330.99	8330.99	8330.99	8330.99			
W045	PFO													37.59
W047	PSS											1286.60		
W051	PSS												103691.28	
W055	PSS	14911.46	14911.49	14911.49	14911.49	14911.46	14911.50	14911.50	14911.50	14911.50	14911.50			
TOTAL (square feet)		**51572.44**	**56479.16**	**56085.36**	**56479.16**	**56473.89**	**55683.29**	**66565.80**	**66565.80**	**64332.47**	**64332.47**	**1286.60**	**103691.28**	**37.59**
TOTAL (acres)		**1.18**	**1.30**	**1.29**	**1.30**	**1.30**	**1.28**	**1.53**	**1.53**	**1.48**	**1.48**	**0.03**	**2.38**	**0.00**

Appendix F
Individual Stream Impacts within the LRT and BRT Alternatives
(Square Feet)

Wetland #	Cowardin Class.	Alt. 3	Alt.4	Alt 4. w/ Preinkert Drive	Alt.5	Alt. 5 w/ Thayer Option	Alt. 6	Alt. 7	Alt 7. w/ Preinkert Drive	Alt. 8	Alt. 8 w/ Thayer Option	Y&S #1	Y&S #2	Y&S #3
WGB-1	R4		4981.19	4981.19	4981.19	4981.19	4955.50	4955.50	4955.50	4955.50	4955.50			
WGB-2	R4		175.09	175.09	175.09	173.20	168.31	168.31	168.31	168.31	168.31			
WGB-3	R4		531.94	531.94	531.94	531.94	531.94	531.94	531.94	531.94	531.94			
WGB-4	R4		253.94	253.94	253.94	253.94	265.50	265.50	265.50	265.50	265.50			
WGB-6	R2	6264.82	6264.82	6264.82	6264.82	6264.82	6377.58	6377.58	6377.58	6377.58	6377.58			
WGB-9	R4		1250.39	1250.39	1237.42	1237.42	1154.72	1154.72	1154.72	1154.72	1154.72			
WUS001	R4	762.98												
WUS003	R2	35.87	611.55	611.55	960.51		960.51	848.08	849.07	960.51				
WUS004	R2					1867.02					1873.62			
WUS005	R2	190.71	190.71	190.71	259.91	259.32	259.91	259.91	259.91	259.91	259.91			
WUS006	R2	489.36	489.36	1973.59	263.34	263.82	263.34	263.77	1937.59	263.34	263.34			
WUS008	R4	223.21	223.21	252.86	5.17	5.17	5.17	5.17	252.86	5.17	5.17			
WUS011	R4	2737.77	2737.77		2737.77	2732.90	2737.78	2737.77		2737.78	2737.78			
WUS016	R2	48.43	48.43	48.43	462.70	462.69	405.67	405.67	405.67	405.67	405.67			
WUS018	R2	6048.64	6048.64	6048.64			11037.51	11037.51	11037.51					
WUS020	R2				448.97	448.97				448.97	448.97			
WUS022	R2				5607.09	5603.84				5456.03	5456.03			
WUS026	R4	217.61	217.61	217.61	217.61	217.61	217.61	217.61	217.61	217.61	217.61	374.04		
WUS027	R2	2263.47	2263.47	2263.47	2263.47	2263.47	2263.47	2263.47	2263.47	2263.47	2263.47			
WUS027	R4	4638.13	4638.13	4638.13	4638.13	4638.13	4638.13	4638.13	4638.13	4638.13	4638.13			
WUS028	R4	97.05	97.05	97.05	97.05	97.04	97.05	97.05	97.05	97.05	97.05			
WUS030	R4	323.11	323.11	323.11	323.11	323.11	323.11	323.11	323.11	323.11	323.11			
WUS032	R4	499.05	499.05	499.05	499.05	499.05	499.05	499.05	499.05	499.05	499.05			
WUS034	R4		1859.06	1859.06	1859.06	1859.06		2541.50	2541.50	2541.50	2541.50			
WUS036	R4							85.38	85.38	61.11	61.11			
WUS038	R4		866.92	866.92	866.92	866.92								
WUS039	R4		5049.35	5049.35	5049.35	5049.35		5049.35	5049.35	5049.35	5049.35			
WUS040	R2	515.74												
WUS043	R2	24.66	24.66	24.66	24.66	24.65	24.66	24.66	24.66	24.66	24.66	4485.84		
WUS046	R2	3.55	3.55	3.55	779.27	779.98	779.29	779.29	779.29	779.29	779.29			
WUS048	R4												525.10	

Appendix F
Individual Stream Impacts within the LRT and BRT Alternatives
(Square Feet)

Wetland #	Cowardin Class.	Alt. 3	Alt.4	Alt 4. w/ Preinkert Drive	Alt.5	Alt. 5 w/ Thayer Option	Alt. 6	Alt. 7	Alt 7. w/ Preinkert Drive	Alt. 8	Alt. 8 w/ Thayer Option	Y&S #1	Y&S #2	Y&S #3
WUS049	R2													13262.61
WUS050	R2													199.64
WUS052	R2													627.99
WUS053	R4													1090.63
WUS054	R4													1063.48
WUS056	R2	414.43	414.43	414.43	414.43	414.43	414.43	414.43	414.43	414.43	414.43			
TOTAL (square feet)		**25798.59**	**40063.43**	**38839.54**	**41221.97**	**42119.04**	**38380.24**	**45944.46**	**45129.19**	**40899.69**	**41812.80**	**4859.88**	**525.10**	**16244.35**

Appendix F
Individual Stream Impacts within the BRT and LRT Alternatives
(Linear Feet)

Wetland #	Cowardin Class.	Alt. 3	Alt.4	Alt 4. w/ Preinkert Drive	Alt.5	Alt. 5 w/ Thayer Option	Alt. 6	Alt. 7	Alt 7. w/ Preinkert Drive	Alt. 8	Alt. 8 w/ Thayer Option	Y&S #1	Y&S #2	Y&S #3
WGB-1	R4		1475.94	1475.94	1475.94	1475.94	1468.55	1468.55	1468.55	1468.55	1468.55			
WGB-2	R4		11.19	11.19	11.19	11.19	10.90	10.90	10.90	10.90	10.90			
WGB-3	R4		70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00			
WGB-4	R4		13.62	13.62	13.62	13.62	11.28	11.28	11.28	11.28	11.28			
WGB-6	R2	97.21	97.21	97.21	97.21	97.21	96.99	96.99	96.99	96.99	96.99			
WGB-9	R4		115.55	115.55	114.22	114.22	106.06	106.06	106.06	106.06	106.06			
WUS001	R4	57.90												
WUS003	R2	0.60	21.79	21.79	33.60		33.60	29.68	29.84	33.60				
WUS004	R2					35.53					35.85			
WUS005	R2	10.95	10.95	10.95	16.39	16.39	16.39	16.39	16.39	16.39	16.39			
WUS006	R2	9.85	9.85	39.97	5.40	5.40	5.40	5.40	39.97	5.40	5.40			
WUS008	R4	16.88	16.88	19.12					19.12					
WUS011	R4	464.51	464.51		464.51	464.51	464.51	464.51		464.51	464.51			
WUS016	R2	4.06	4.06	4.06	80.23	80.23	69.32	69.32	69.32	69.32	69.32			
WUS018	R2	74.96	74.96	74.96			148.21	148.21	148.21					
WUS020	R2				86.90	86.91				86.91	86.91			
WUS022	R2				93.21	93.21				92.11	92.11			
WUS026	R4	51.75	51.75	51.75	51.75	51.75	51.75	51.75		51.75	51.75	85.46		
WUS027	R2	432.37	432.37	432.37	432.37	432.37	432.37	432.37	432.37	432.37	432.37			
WUS027	R4	886.40	886.40	886.40	886.40	886.40	886.40	886.40	886.40	886.40	886.40			
WUS028	R4	36.45	36.45	36.45	36.45	36.45	36.45	36.45	36.45	36.45	36.45			
WUS030	R4	72.07	72.07	72.07	72.07	72.07	72.07	72.07	72.07	72.07	72.07			
WUS032	R4	111.99	111.99	111.99	111.99	111.99	111.99	111.99	111.99	111.99	111.99			
WUS034	R4		492.14	492.14	492.14	492.14		599.48	599.48	599.48	599.48			
WUS036	R4							10.14	10.14	7.19	7.19			
WUS038	R4		141.89	141.89	141.89	141.89								
WUS039	R4		800.50	800.50	800.50	800.50		800.50	800.50	800.50	800.50			
WUS043	R2											298.40		
WUS046	R2				40.91	40.91	40.91	40.91	40.91	40.91	40.91			
WUS048	R4												35.49	

Appendix F
Individual Stream Impacts within the BRT and LRT Alternatives
(Linear Feet)

Wetland #	Cowardin Class.	Alt. 3	Alt.4	Alt 4. w/ Preinkert Drive	Alt.5	Alt. 5 w/ Thayer Option	Alt. 6	Alt. 7	Alt 7. w/ Preinkert Drive	Alt. 8	Alt. 8 w/ Thayer Option	Y&S #1	Y&S #2	Y&S #3
WUS049	R2													1040.41
WUS050	R2													53.79
WUS052	R2													128.94
WUS053	R4													104.01
WUS054	R4													227.01
WUS056	R2	88.48	88.48	88.48	88.48	88.48	88.48	88.48	88.48	88.48	88.48			
TOTAL (linear feet)		**2416.43**	**5500.55**	**5068.40**	**5717.37**	**5719.31**	**4221.63**	**5627.83**	**5165.42**	**5659.61**	**5661.86**	**383.86**	**35.49**	**1554.16**

Appendix G

Wetland Mitigation

Evaluation Worksheets

Intercounty Connector
Wetland Mitigation Site Evaluation

County: ______________________
ADC Map: ______________________
USGS Quad: ______________________
Watershed: ______________________
Adjacent Stream: ______________________

Site No. __________
Site Area (ac): __________
Site Retained: __________

Score: __________
Yield (ac): __________

Location Details: ______________________

Owner Name: ______________________
Address: ______________________

Tax Map: __________
Parcel: __________

Grid: __________
Zoning: __________

Telephone: ______________________

Date Contacted: ______________________

Comments: ______________________

SITE MAP OR AERIAL PHOTO

Wetland Mitigation Site Evaluation Worksheet

Field Verification Date: 9/7/2007

Site Identification: **RC-2** **Mitigation Ranking Total:**

Technical Criteria			Additional Information
Soils	Greater than 50% hydric soil	10	
	10% to 50% hydric soil	5	
	Less than 10% hydric soil	1	
	TOTAL	**10**	
Hydrology			small pond in center of site
	Linked to floodplain/stream	10	
	Linked to surface/groundwater depression	5	
	Not linked to stream/wetland	1	
	TOTAL	**5**	
	Drainage Area		
	Greater than 15:1	10	
	5:1 to 15:1	5	
	Less than 5:1	1	
	TOTAL		
Landscape Position			low in comparison to surrounding landscape (according to contous)
	Topographically low	10	
	Topographically intermediate	5	
	Topographically high	1	
	TOTAL	**10**	
Vegetation	Farmed Wetlands/Farmed Wetland Pastures		
	Yes	10	
	No	1	
	TOTAL	**1**	
	Fallow		
	Yes	10	
	No	1	
	TOTAL	**10**	
Habitat and Water Quality			
	Contiguous to wetland/upl forest >100 acres	10	
	Contiguous to wetland/upl forest 25-100 acres	5	
	Contiguous to wetland/upl forest <25 ac.	1	
	TOTAL	**1**	
	Drainage from urban land	10	
	Drainage from agricultural land	5	
	Drainage from parkland	1	
	TOTAL	**10**	
Constraints			
	Utilities		
	None	10	
	One	5	
	More than one	1	
	TOTAL	**10**	
	Access		
	Within 500 feet of Public Road	10	
	Within 500-2000 feet of Public Road	5	
	Within >2,000 feet of Public Road	1	
	TOTAL	**10**	
	Mitigation Ranking Total	**67**	

Comments:
Could not see the site due to access issues, need permission from National Naval Medical Center. The potential source of hydrology is unknown.

Wetland Mitigation Site Evaluation Worksheet

Field Verification Date: 9/7/2007

Site Identification: **RC-3** **Mitigation Ranking Total:**

Technical Criteria			Additional Information
Soils	Greater than 50% hydric soil	10	
	10% to 50% hydric soil	5	
	Less than 10% hydric soil	1	
	TOTAL	**10**	
Hydrology			
	Linked to floodplain/stream	10	
	Linked to surface/groundwater depression	5	
	Not linked to stream/wetland	1	
	TOTAL	**10**	
	Drainage Area		
	Greater than 15:1	10	
	5:1 to 15:1	5	
	Less than 5:1	1	
	TOTAL		
Landscape Position			
	Topographically low	10	
	Topographically intermediate	5	
	Topographically high	1	
	TOTAL	**5**	
Vegetation	Farmed Wetlands/Farmed Wetland Pastures		
	Yes	10	
	No	1	
	TOTAL	**1**	
	Fallow		Partially mowed
	Yes	10	
	No	1	
	TOTAL	**10**	
Habitat and Water Quality			
	Contiguous to wetland/upl forest >100 acres	10	
	Contiguous to wetland/upl forest 25-100 acres	5	
	Contiguous to wetland/upl forest <25 ac.	1	
	TOTAL	**10**	
	Drainage from urban land		Site is within Rock Creek Park
	Drainage from agricultural land	5	
	Drainage from parkland	1	
	TOTAL	**1**	
Constraints			Sewer line crossing on west side of site
	Utilities		
	None	10	
	One	5	
	More than one	1	
	TOTAL	**5**	
	Access		
	Within 500 feet of Public Road	10	
	Within 500-2000 feet of Public Road	5	
	Within >2,000 feet of Public Road	1	
	TOTAL	**10**	
	Mitigation Ranking Total	**62**	

Comments:
Site is adjacent to scrub-shrub wetland on the east side, could possibly be hydrologically connected to this wetland by grading. Stream channel that borders the site on the west will not assist with hydrology because it is too incised.

Wetland Mitigation Site Evaluation Worksheet

Field Verification Date: 9/7/2007

Site Identification: **RC-5** **Mitigation Ranking Total:**

Technical Criteria			Additional Information
Soils	Greater than 50% hydric soil	10	
	10% to 50% hydric soil	5	
	Less than 10% hydric soil	1	
	TOTAL	**10**	
Hydrology			
	Linked to floodplain/stream	10	
	Linked to surface/groundwater depression	5	
	Not linked to stream/wetland	1	
	TOTAL	**10**	
	Drainage Area		
	Greater than 15:1	10	
	5:1 to 15:1	5	
	Less than 5:1	1	
	TOTAL		
Landscape Position			
	Topographically low	10	
	Topographically intermediate	5	
	Topographically high	1	
	TOTAL	**10**	
Vegetation	Farmed Wetlands/Farmed Wetland Pastures		
	Yes	10	
	No	1	
	TOTAL	**1**	
	Fallow		Site is very overgrown with vines (trumpet creeper, asiatic tearthumb, rubus)
	Yes	10	
	No	1	
	TOTAL	**10**	
Habitat and Water Quality			
	Contiguous to wetland/upl forest >100 acres	10	
	Contiguous to wetland/upl forest 25-100 acres	5	
	Contiguous to wetland/upl forest <25 ac.	1	
	TOTAL	**5**	
	Drainage from urban land		Renewable Natural Resources Foundation
	Drainage from agricultural land	5	
	Drainage from parkland	1	
	TOTAL	**1**	
Constraints			Small powerline crossing and a sewer line crossing
	Utilities		
	None	10	
	One	5	
	More than one	1	
	TOTAL	**1**	
	Access		
	Within 500 feet of Public Road	10	
	Within 500-2000 feet of Public Road	5	
	Within >2,000 feet of Public Road	1	
	TOTAL	**5**	
	Mitigation Ranking Total	**53**	

Comments:
Difficult to see the layout of the land due to the overgrown vines. Site is high in the watershed and the drainage area appears very small, so finding a hydrologic source may be difficult.

Wetland Mitigation Site Evaluation Worksheet

Field Verification Date: 8/28/2007

Site Identification: **RC-6**   **Mitigation Ranking Total:**

Technical Criteria			Additional Information
Soils	Greater than 50% hydric soil	10	
	10% to 50% hydric soil	5	
	Less than 10% hydric soil	1	
	TOTAL	**10**	
Hydrology			
	Linked to floodplain/stream	10	
	Linked to surface/groundwater depression	5	
	Not linked to stream/wetland	1	
	TOTAL	**10**	
	Drainage Area		
	Greater than 15:1	10	
	5:1 to 15:1	5	
	Less than 5:1	1	
	TOTAL		
Landscape Position			
	Topographically low	10	
	Topographically intermediate	5	
	Topographically high	1	
	TOTAL	**10**	
Vegetation	Farmed Wetlands/Farmed Wetland Pastures		
	Yes	10	
	No	1	
	TOTAL	**1**	
	Fallow		mowed sports fields
	Yes	10	
	No	1	
	TOTAL	**10**	
Habitat and Water Quality			
	Contiguous to wetland/upl forest >100 acres	10	
	Contiguous to wetland/upl forest 25-100 acres	5	
	Contiguous to wetland/upl forest <25 ac.	1	
	TOTAL	**5**	
	Drainage from urban land		park appears well used
	Drainage from agricultural land	5	
	Drainage from parkland	1	
	TOTAL	**1**	
Constraints			
	Utilities		
	None	10	
	One	5	
	More than one	1	
	TOTAL	**10**	
	Access		access via paved park trail
	Within 500 feet of Public Road	10	
	Within 500-2000 feet of Public Road	5	
	Within >2,000 feet of Public Road	1	
	TOTAL	**5**	
	Mitigation Ranking Total	**62**	

Comments:
Site is adjacent to PFO/PSS wetlands. There is very little to no elevation difference between the site and the adjacent wetlands so very little, if any, grading would be necessary.

Wetland Mitigation Site Evaluation Worksheet

Field Verification Date: 8/28/2007

Site Identification: **RC-7/RC-8** **Mitigation Ranking Total:**

Technical Criteria			Additional Information
Soils	Greater than 50% hydric soil	10	
	10% to 50% hydric soil	5	
	Less than 10% hydric soil	1	
	TOTAL	**10**	
Hydrology			
	Linked to floodplain/stream	10	
	Linked to surface/groundwater depression	5	
	Not linked to stream/wetland	1	
	TOTAL	**1**	
	Drainage Area		
	Greater than 15:1	10	
	5:1 to 15:1	5	
	Less than 5:1	1	
	TOTAL		
Landscape Position			
	Topographically low	10	
	Topographically intermediate	5	
	Topographically high	1	
	TOTAL	**5**	
Vegetation	Farmed Wetlands/Farmed Wetland Pastures		
	Yes	10	
	No	1	
	TOTAL	**1**	
	Fallow		mowed field
	Yes	10	
	No	1	
	TOTAL	**10**	
Habitat and Water Quality			
	Contiguous to wetland/upl forest >100 acres	10	
	Contiguous to wetland/upl forest 25-100 acres	5	
	Contiguous to wetland/upl forest <25 ac.	1	
	TOTAL	**10**	
	Drainage from urban land	10	
	Drainage from agricultural land	5	
	Drainage from parkland	1	
	TOTAL	**10**	
Constraints			sewer line crossing
	Utilities		
	None	10	
	One	5	
	More than one	1	
	TOTAL	**5**	
	Access		
	Within 500 feet of Public Road	10	
	Within 500-2000 feet of Public Road	5	
	Within >2,000 feet of Public Road	1	
	TOTAL	**10**	
	Mitigation Ranking Total	**62**	

Comments:

These sites are situated 8 to 10 feet above the stream. Mitigation would require a lot of grading . Not a good site since it would require a lot of grading to link hydrology.

Wetland Mitigation Site Evaluation Worksheet

Field Verification Date: 8/28/2007

Site Identification: **RC-9** **Mitigation Ranking Total:**

Technical Criteria			Additional Information
Soils	Greater than 50% hydric soil	10	
	10% to 50% hydric soil	5	
	Less than 10% hydric soil	1	
	TOTAL	**10**	
Hydrology			
	Linked to floodplain/stream	10	
	Linked to surface/groundwater depression	5	
	Not linked to stream/wetland	1	
	TOTAL	**10**	
	Drainage Area		
	Greater than 15:1	10	
	5:1 to 15:1	5	
	Less than 5:1	1	
	TOTAL		
Landscape Position			
	Topographically low	10	
	Topographically intermediate	5	
	Topographically high	1	
	TOTAL	**5**	
Vegetation	Farmed Wetlands/Farmed Wetland Pastures		
	Yes	10	
	No	1	
	TOTAL	**1**	
	Fallow		maintained sports fields
	Yes	10	
	No	1	
	TOTAL	**10**	
Habitat and Water Quality			adjacent to forested floodplain wetland, dominated by sycamore, box elder, green ash
	Contiguous to wetland/upl forest >100 acres	10	
	Contiguous to wetland/upl forest 25-100 acres	5	
	Contiguous to wetland/upl forest <25 ac.	1	
	TOTAL	**10**	
	Drainage from urban land	10	
	Drainage from agricultural land	5	
	Drainage from parkland	1	
	TOTAL	**10**	
Constraints			
	Utilities		
	None	10	
	One	5	
	More than one	1	
	TOTAL	**10**	
	Access		"Parklawn Soccer Fields"
	Within 500 feet of Public Road	10	
	Within 500-2000 feet of Public Road	5	
	Within >2,000 feet of Public Road	1	
	TOTAL	**10**	
	Mitigation Ranking Total	**76**	

Comments:
Site is adjacent to forested floodplain wetland and there is very little elevation difference, so little grading would be necessary. A 4 foot paved trail parallels the treeline and would need to be removed.

Wetland Mitigation Site Evaluation Worksheet

Field Verification Date: 8/28/2007

Site Identification: **RC-10** **Mitigation Ranking Total:**

Technical Criteria			**Additional Information**
Soils	Greater than 50% hydric soil	10	
	10% to 50% hydric soil	5	
	Less than 10% hydric soil	1	
	TOTAL	**10**	
Hydrology			
	Linked to floodplain/stream	10	
	Linked to surface/groundwater depression	5	
	Not linked to stream/wetland	1	
	TOTAL	**1**	
	Drainage Area		
	Greater than 15:1	10	
	5:1 to 15:1	5	
	Less than 5:1	1	
	TOTAL		
Landscape Position			
	Topographically low	10	
	Topographically intermediate	5	
	Topographically high	1	
	TOTAL	**1**	
Vegetation	Farmed Wetlands/Farmed Wetland Pastures		
	Yes	10	
	No	1	
	TOTAL	**1**	
	Fallow		appears disturbed; dominated by japanese stilt grass and tearthumb
	Yes	10	
	No	1	
	TOTAL	**10**	
Habitat and Water Quality			
	Contiguous to wetland/upl forest >100 acres	10	
	Contiguous to wetland/upl forest 25-100 acres	5	
	Contiguous to wetland/upl forest <25 ac.	1	
	TOTAL	**10**	
	Drainage from urban land	10	
	Drainage from agricultural land	5	
	Drainage from parkland	1	
	TOTAL	**10**	
Constraints			
	Utilities		
	None	10	
	One	5	
	More than one	1	
	TOTAL	**10**	
	Access		
	Within 500 feet of Public Road	10	
	Within 500-2000 feet of Public Road	5	
	Within >2,000 feet of Public Road	1	
	TOTAL	**5**	
	Mitigation Ranking Total	**58**	

Comments:
Site is elevated approximately 8 feet above the surrounding floodplain/stream. A lot of grading would be necessary to link the site to the surrounding floodplain.

Appendix H

Stream Mitigation

Evaluation Worksheets

Stream Mitigation Site Evaluation Worksheet

Field Verification Date: 8/28/2007

Site Identification: AR-1 **Mitigation Ranking Total:** 47

Technical Criteria		Factor	Additional Information
Riparian Condition			
	Urban land, active agriculture	10	
	Herbaceous buffer	5	
	Scrub-shrub buffer	2	
	Forested buffer	0	
	SCORE	**0**	
Watershed Position			Beaverdam Creek
	Headwater stream	10	
	Mid-watershed position	5	
	Low watershed position	1	
	SCORE	**1**	
Fish Blockage			concrete apron from triple box culvert causing a 2 ft drop; 0.5' drop from corrugated culvert
	Yes	10	
	No	1	
	SCORE	**10**	
Stream Morphology			
	Concrete-lined	10	
	Channelized with natural substrate	5	
	Natural stream condition and pattern	1	
	SCORE	**10**	
Green Infrastructure			
	Green infrastructure gap	10	
	Green infrastructure hub or corridor	1	
	SCORE	**10**	
Habitat & Water Quality			
	Poor instream habitat	10	
	Fair instream habitat	5	
	Good instream habitat	1	
	SCORE	**5**	
	Erosion		
	Severe	10	
	Moderate	5	
	Low	1	
	SCORE	**1**	
Access			
	Within 500 feet of Public Road	10	
	Within 500-2000 feet of Public Road	5	
	Within >2,000 feet of Public Road	1	
	SCORE	**10**	
	Mitigation Ranking Total	**47**	

Comments:
The concrete apron from the box culvert at Landover Rd is has created a fish blockage. A tributary flows into the mainstem from a twin corrugated culvert to the east, which has also created a fish blockage.

Stream Mitigation Site Evaluation Worksheet

Field Verification Date: 8/28/2007

Site Identification: AR-2 **Mitigation Ranking Total:** 55

Technical Criteria		Factor	Additional Information
Riparian Condition			
	Urban land, active agriculture	10	
	Herbaceous buffer	5	
	Scrub-shrub buffer	2	
	Forested buffer	0	
	SCORE	**0**	
Watershed Position			tributary to Beaverdam Creek
	Headwater stream	10	
	Mid-watershed position	5	
	Low watershed position	1	
	SCORE	**5**	
Fish Blockage			concrete apron from twin box culvert creating 3 ft drop
	Yes	10	
	No	1	
	SCORE	**10**	
Stream Morphology			
	Concrete-lined	10	
	Channelized with natural substrate	5	
	Natural stream condition and pattern	1	
	SCORE	**10**	
Green Infrastructure			
	Green infrastructure gap	10	
	Green infrastructure hub or corridor	1	
	SCORE	**10**	
Habitat & Water Quality			
	Poor instream habitat	10	
	Fair instream habitat	5	
	Good instream habitat	1	
	SCORE	**5**	
	Erosion		unstable banks adjacent to culvert
	Severe	10	
	Moderate	5	
	Low	1	
	SCORE	**5**	
Access			
	Within 500 feet of Public Road	10	
	Within 500-2000 feet of Public Road	5	
	Within >2,000 feet of Public Road	1	
	SCORE	**10**	
	Mitigation Ranking Total	**55**	

Comments:

The concrete apron from the box culvert is creating a 3 foot drop downstream of Landover Rd. The banks adjacent to the culvert appear unstable and a concrete pipe near the culvert is being undermined. This site was investigated for

Stream Mitigation Site Evaluation Worksheet

Field Verification Date: 8/28/2007

Site Identification: AR-5 **Mitigation Ranking Total:** 53

Technical Criteria		Factor	Additional Information
Riparian Condition			mix of forest and scrub-shrub buffer
	Urban land, active agriculture	10	
	Herbaceous buffer	5	
	Scrub-shrub buffer	2	
	Forested buffer	0	
	SCORE	**2**	
Watershed Position			Beaverdam Creek
	Headwater stream	10	
	Mid-watershed position	5	
	Low watershed position	1	
	SCORE	**5**	
Fish Blockage			
	Yes	10	
	No	1	
	SCORE	**1**	
Stream Morphology			15ft wide by 4ft deep
	Concrete-lined	10	
	Channelized with natural substrate	5	
	Natural stream condition and pattern	1	
	SCORE	**10**	
Green Infrastructure			
	Green infrastructure gap	10	
	Green infrastructure hub or corridor	1	
	SCORE	**10**	
Habitat & Water Quality			water is cloudy and greyish in color; abundance of trash present in the channel
	Poor instream habitat	10	
	Fair instream habitat	5	
	Good instream habitat	1	
	SCORE	**5**	
	Erosion		
	Severe	10	
	Moderate	5	
	Low	1	
	SCORE	**10**	
Access			
	Within 500 feet of Public Road	10	
	Within 500-2000 feet of Public Road	5	
	Within >2,000 feet of Public Road	1	
	SCORE	**10**	
	Mitigation Ranking Total	**53**	

Comments:

Construction access may be difficult due to steep slopes and a narrow work area caused by the business lots on the left and roadway on the right

Stream Mitigation Site Evaluation Worksheet

Field Verification Date: 8/28/2007

Site Identification: AR-9 **Mitigation Ranking Total:** 51

Technical Criteria		Factor	Additional Information
Riparian Condition			
	Urban land, active agriculture	10	
	Herbaceous buffer	5	
	Scrub-shrub buffer	2	
	Forested buffer	0	
	SCORE	**0**	
Watershed Position			tributary to Beaverdam Creek
	Headwater stream	10	
	Mid-watershed position	5	
	Low watershed position	1	
	SCORE	**10**	
Fish Blockage			
	Yes	10	
	No	1	
	SCORE	**1**	
Stream Morphology			20ft wide by 8ft deep
	Concrete-lined	10	
	Channelized with natural substrate	5	
	Natural stream condition and pattern	1	
	SCORE	**5**	
Green Infrastructure			
	Green infrastructure gap	10	
	Green infrastructure hub or corridor	1	
	SCORE	**10**	
Habitat & Water Quality			cloudy/grayish water
	Poor instream habitat	10	
	Fair instream habitat	5	
	Good instream habitat	1	
	SCORE	**5**	
	Erosion		vertical banks
	Severe	10	
	Moderate	5	
	Low	1	
	SCORE	**10**	
Access			Barlowe Rd crosses stream
	Within 500 feet of Public Road	10	
	Within 500-2000 feet of Public Road	5	
	Within >2,000 feet of Public Road	1	
	SCORE	**10**	
	Mitigation Ranking Total	**51**	

Comments:

Due to the forested buffer, construction access may be difficult.

Stream Mitigation Site Evaluation Worksheet

Field Verification Date: 8/28/2007

Site Identification: AR-12 **Mitigation Ranking Total:** 48

Technical Criteria		Factor	Additional Information
Riparian Condition			partial forest/partial scrub-shrub
	Urban land, active agriculture	10	
	Herbaceous buffer	5	
	Scrub-shrub buffer	2	
	Forested buffer	0	
	SCORE	**2**	
Watershed Position			Long Branch
	Headwater stream	10	
	Mid-watershed position	5	
	Low watershed position	1	
	SCORE	**5**	
Fish Blockage			
	Yes	10	
	No	1	
	SCORE	**1**	
Stream Morphology			gabion placed on right bank downstream of Piney Branch Rd
	Concrete-lined	10	
	Channelized with natural substrate	5	
	Natural stream condition and pattern	1	
	SCORE	**5**	
Green Infrastructure			
	Green infrastructure gap	10	
	Green infrastructure hub or corridor	1	
	SCORE	**10**	
Habitat & Water Quality			large amount of trash; water is dark color and sewage smell was noticed
	Poor instream habitat	10	
	Fair instream habitat	5	
	Good instream habitat	1	
	SCORE	**5**	
	Erosion		severe erosion, especially downstream of Piney Branch Rd
	Severe	10	
	Moderate	5	
	Low	1	
	SCORE	**10**	
Access			
	Within 500 feet of Public Road	10	
	Within 500-2000 feet of Public Road	5	
	Within >2,000 feet of Public Road	1	
	SCORE	**10**	
	Mitigation Ranking Total	**48**	

Comments:

Evidence of people living in forested buffer

Stream Mitigation Site Evaluation Worksheet

Field Verification Date: 9/13/2007

Site Identification: AR-14 **Mitigation Ranking Total:** 57

Technical Criteria		Factor	Additional Information
Riparian Condition			partially mowed grass, some trees and shrubs; stream is fenced
	Urban land, active agriculture	10	
	Herbaceous buffer	5	
	Scrub-shrub buffer	2	
	Forested buffer	0	
	SCORE	**5**	
Watershed Position			
	Headwater stream	10	
	Mid-watershed position	5	
	Low watershed position	1	
	SCORE	**10**	
Fish Blockage			
	Yes	10	
	No	1	
	SCORE	**1**	
Stream Morphology			10 ft wide by 5 ft deep concrete-lined box channel
	Concrete-lined	10	
	Channelized with natural substrate	5	
	Natural stream condition and pattern	1	
	SCORE	**10**	
Green Infrastructure			
	Green infrastructure gap	10	
	Green infrastructure hub or corridor	1	
	SCORE	**10**	
Habitat & Water Quality			
	Poor instream habitat	10	
	Fair instream habitat	5	
	Good instream habitat	1	
	SCORE	10	
	Erosion		
	Severe	10	
	Moderate	5	
	Low	1	
	SCORE	**1**	
Access			power substation off right bank
	Within 500 feet of Public Road	10	
	Within 500-2000 feet of Public Road	5	
	Within >2,000 feet of Public Road	1	
	SCORE	**10**	
	Mitigation Ranking Total	**57**	

Comments:

Good potentional site. Contrete-lined until it crosses Ray Rd. Good access from left bank but right bank has steep slope and power substation. A new headwall was being constructed at the Ray Rd culvert, however, severe erosion

Stream Mitigation Site Evaluation Worksheet

Field Verification Date: 8/28/2007

Site Identification: AR-21 **Mitigation Ranking Total:** 52

Technical Criteria		Factor	Additional Information
Riparian Condition			partial forest/partial scrub-shrub
	Urban land, active agriculture	10	
	Herbaceous buffer	5	
	Scrub-shrub buffer	2	
	Forested buffer	0	
	SCORE	**2**	
Watershed Position			Tributary to Northwest Branch
	Headwater stream	10	
	Mid-watershed position	5	
	Low watershed position	1	
	SCORE	**5**	
Fish Blockage			sewer line crossing causing 1.5' to 2' drop
	Yes	10	
	No	1	
	SCORE	**10**	
Stream Morphology			15' wide by 3' deep channel, very straight
	Concrete-lined	10	
	Channelized with natural substrate	5	
	Natural stream condition and pattern	1	
	SCORE	**5**	
Green Infrastructure			partial gap/partial corridor
	Green infrastructure gap	10	
	Green infrastructure hub or corridor	1	
	SCORE	**10**	
Habitat & Water Quality			moderate amount of trash in channel
	Poor instream habitat	10	
	Fair instream habitat	5	
	Good instream habitat	1	
	SCORE	**5**	
	Erosion		
	Severe	10	
	Moderate	5	
	Low	1	
	SCORE	**5**	
Access			
	Within 500 feet of Public Road	10	
	Within 500-2000 feet of Public Road	5	
	Within >2,000 feet of Public Road	1	
	SCORE	**10**	
	Mitigation Ranking Total	**52**	

Comments:

Good potential site. Access may be an issue due to forested/scrub-shrub buffer.

Stream Mitigation Site Evaluation Worksheet

Field Verification Date: 9/13/2007

Site Identification: PR-1 **Mitigation Ranking Total:** 52

Technical Criteria		Factor	Additional Information
Riparian Condition			
	Urban land, active agriculture	10	
	Herbaceous buffer	5	
	Scrub-shrub buffer	2	
	Forested buffer	0	
	SCORE	**1**	
Watershed Position			tributary to Little Falls
	Headwater stream	10	
	Mid-watershed position	5	
	Low watershed position	1	
	SCORE	**10**	
Fish Blockage			
	Yes	10	
	No	1	
	SCORE	**1**	
Stream Morphology			15ft wide by 5ft deep, very straightened channel
	Concrete-lined	10	
	Channelized with natural substrate	5	
	Natural stream condition and pattern	1	
	SCORE	**5**	
Green Infrastructure			
	Green infrastructure gap	10	
	Green infrastructure hub or corridor	1	
	SCORE	**10**	
Habitat & Water Quality			
	Poor instream habitat	10	
	Fair instream habitat	5	
	Good instream habitat	1	
	SCORE	**5**	
	Erosion		
	Severe	10	
	Moderate	5	
	Low	1	
	SCORE	**10**	
Access			
	Within 500 feet of Public Road	10	
	Within 500-2000 feet of Public Road	5	
	Within >2,000 feet of Public Road	1	
	SCORE	**10**	
	Mitigation Ranking Total	**52**	

Comments:
Good potentional restoration site due to the severe erosion and channelization. Construction access could be difficult due to the forested buffer.

Stream Mitigation Site Evaluation Worksheet

Field Verification Date: 9/13/2007

Site Identification: PR-2 **Mitigation Ranking Total:** 49

Technical Criteria		Factor	Additional Information
Riparian Condition			large trees on the left bank, small trees and scrub-shrub on the right bank; channel is fenced
	Urban land, active agriculture	10	
	Herbaceous buffer	5	
	Scrub-shrub buffer	2	
	Forested buffer	0	
	SCORE	**2**	
Watershed Position			tributary to Little Falls
	Headwater stream	10	
	Mid-watershed position	5	
	Low watershed position	1	
	SCORE	**5**	
Fish Blockage			
	Yes	10	
	No	1	
	SCORE	**1**	
Stream Morphology			25ft wide by 8ft deep, concrete-lined box channel
	Concrete-lined	10	
	Channelized with natural substrate	5	
	Natural stream condition and pattern	1	
	SCORE	**10**	
Green Infrastructure			
	Green infrastructure gap	10	
	Green infrastructure hub or corridor	1	
	SCORE	**10**	
Habitat & Water Quality			
	Poor instream habitat	10	
	Fair instream habitat	5	
	Good instream habitat	1	
	SCORE	**10**	
	Erosion		
	Severe	10	
	Moderate	5	
	Low	1	
	SCORE	**1**	
Access			Hillendale Rd; right bank is more open for construction access; left bank has more large trees immediately followed by a apartment complex
	Within 500 feet of Public Road	10	
	Within 500-2000 feet of Public Road	5	
	Within >2,000 feet of Public Road	1	
	SCORE	**10**	
	Mitigation Ranking Total	**49**	

Comments:
Construction access may be an issue at this site, especially on the left bank.

Stream Mitigation Site Evaluation Worksheet

Field Verification Date: 9/13/2007

Site Identification: PR-3 **Mitigation Ranking Total:** 51

Technical Criteria		Factor	Additional Information
Riparian Condition			
	Urban land, active agriculture	10	
	Herbaceous buffer	5	
	Scrub-shrub buffer	2	
	Forested buffer	0	
	SCORE	**0**	
Watershed Position			mainstem of Little Falls
	Headwater stream	10	
	Mid-watershed position	5	
	Low watershed position	1	
	SCORE	**1**	
Fish Blockage			sewer line crossing creating 3' drop
	Yes	10	
	No	1	
	SCORE	**10**	
Stream Morphology			50ft wide by 15ft deep, channelized from culvert
	Concrete-lined	10	
	Channelized with natural substrate	5	
	Natural stream condition and pattern	1	
	SCORE	**5**	
Green Infrastructure			
	Green infrastructure gap	10	
	Green infrastructure hub or corridor	1	
	SCORE	**10**	
Habitat & Water Quality			sewage smell noticed
	Poor instream habitat	10	
	Fair instream habitat	5	
	Good instream habitat	1	
	SCORE	**5**	
	Erosion		severe erosion on left bank
	Severe	10	
	Moderate	5	
	Low	1	
	SCORE	**10**	
Access			
	Within 500 feet of Public Road	10	
	Within 500-2000 feet of Public Road	5	
	Within >2,000 feet of Public Road	1	
	SCORE	**10**	
	Mitigation Ranking Total	**51**	

Comments:

Good potentional mitigation site due to fish blockage and severe erosion. Access could be a problem since the site is within a park and it has a forested buffer, however, a trail parallels the stream on the right bank and the forested in

Stream Mitigation Site Evaluation Worksheet

Field Verification Date: 9/13/2007

Site Identification: PR-4 **Mitigation Ranking Total:** 52

Technical Criteria		Factor	Additional Information
Riparian Condition			mostly mowed grass with scattered trees and shrubs
	Urban land, active agriculture	10	
	Herbaceous buffer	5	
	Scrub-shrub buffer	2	
	Forested buffer	0	
	SCORE	**5**	
Watershed Position			tributary to Little Falls
	Headwater stream	10	
	Mid-watershed position	5	
	Low watershed position	1	
	SCORE	**5**	
Fish Blockage			
	Yes	10	
	No	1	
	SCORE	**1**	
Stream Morphology			7ft wide by 4ft deep, conrete-lined trapezoidal channel
	Concrete-lined	10	
	Channelized with natural substrate	5	
	Natural stream condition and pattern	1	
	SCORE	**10**	
Green Infrastructure			
	Green infrastructure gap	10	
	Green infrastructure hub or corridor	1	
	SCORE	**10**	
Habitat & Water Quality			
	Poor instream habitat	10	
	Fair instream habitat	5	
	Good instream habitat	1	
	SCORE	**10**	
	Erosion		
	Severe	10	
	Moderate	5	
	Low	1	
	SCORE	**1**	
Access			Little Falls Rd paralles the stream
	Within 500 feet of Public Road	10	
	Within 500-2000 feet of Public Road	5	
	Within >2,000 feet of Public Road	1	
	SCORE	**10**	
	Mitigation Ranking Total	**52**	

Comments:
Good construction access, especially from left side. Left buffer is mowed grass with scattered trees immediately followed by roadway.

Stream Mitigation Site Evaluation Worksheet

Field Verification Date: 9/13/2007

Site Identification: PR-5 **Mitigation Ranking Total:** 49

Technical Criteria		Factor	Additional Information
Riparian Condition			narrow scrub-shrub buffer with scattered large trees immediately followed by apartment complex to the left bank
	Urban land, active agriculture	10	
	Herbaceous buffer	5	
	Scrub-shrub buffer	2	
	Forested buffer	0	
	SCORE	**2**	
Watershed Position			tributary to Little Falls
	Headwater stream	10	
	Mid-watershed position	5	
	Low watershed position	1	
	SCORE	**5**	
Fish Blockage			
	Yes	10	
	No	1	
	SCORE	**1**	
Stream Morphology			5ft wide by 4ft deep concrete-lined box channel
	Concrete-lined	10	
	Channelized with natural substrate	5	
	Natural stream condition and pattern	1	
	SCORE	**10**	
Green Infrastructure			
	Green infrastructure gap	10	
	Green infrastructure hub or corridor	1	
	SCORE	**10**	
Habitat & Water Quality			
	Poor instream habitat	10	
	Fair instream habitat	5	
	Good instream habitat	1	
	SCORE	**10**	
	Erosion		
	Severe	10	
	Moderate	5	
	Low	1	
	SCORE	**1**	
Access			
	Within 500 feet of Public Road	10	
	Within 500-2000 feet of Public Road	5	
	Within >2,000 feet of Public Road	1	
	SCORE	**10**	
	Mitigation Ranking Total	**49**	

Comments:
Construction access may be difficult due to the narrow buffer immediately followed by apartment complex on left side.

Appendix I

Resource Agency Correspondence

MARYLAND
DEPARTMENT OF
NATURAL RESOURCES

Martin O'Malley, Governor
Anthony G. Brown, Lt. Governor
John R. Griffin, Secretary
Eric Schwaab, Deputy Secretary

April 6, 2007

RECEIVED
APR 12 2007
OFFICE OF PLANNING
PROJECT DEVELOPMENT

Ms. Dawnn McCleary
Maryland Department of Transportation
Maryland Transit Administration
6 Saint Paul Street
Baltimore, MD 21202-1614

RE: Environmental Review for Proposed Purple Line for Metrorail, Prince George's and Montgomery Counties, Maryland.

Dear Ms. McCleary:

The Wildlife and Heritage Service has determined that there are no State or Federal records for rare, threatened or endangered species within the boundaries of the project site as delineated. This statement should not be interpreted however as meaning that rare, threatened or endangered species are not in fact present. If appropriate habitat is available, certain species could be present without documentation because adequate surveys have not been conducted.

Our analysis of the information provided also suggests that the forested area on or adjacent to the project site contains Forest Interior Dwelling Bird habitat. Populations of many Forest Interior Dwelling Bird Species (FIDS) are declining in Maryland and throughout the eastern United States. The conservation of FIDS habitat is strongly encouraged by the Department of Natural Resources. The following guidelines will help minimize the project's impacts on FIDS and other native forest plants and wildlife:

1. Avoid placement of new metro line routes or related construction in the forest interior. If forest loss or disturbance is absolutely unavoidable, restrict development to the perimeter of the forest (i.e., within 300 feet of the existing forest edge), and avoid route placement in areas of high quality FIDS habitat (e.g., old-growth forest). Maximize the amount of remaining contiguous forested habitat.

2. Do not remove or disturb forest habitat during May-August, the breeding season for most FIDS. This seasonal restriction may be expanded to February-August if certain early nesting FIDS (e.g., Barred Owl) are present.

3. Maintain forest habitat as close as possible to the metro line route, and maintain canopy closure where possible.

4. Maintain grass height at least 10" during the breeding season (May-August).

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Habitat Conservation Division
Chesapeake Bay Program Office
410 Severn Ave., Suite 107A
Annapolis, Maryland 21403

March 19, 2007

MEMORANDUM TO: Dawnn McCleary
MTA, Environmental Documentation, Office of Planning

FROM: John Nichols JSN

SUBJECT: Purple Line, Prince Georges and Montgomery Counties

This pertains to your request for information on resources of interest to National Marine Fisheries Service (NMFS) that may be affected by the proposed Purple Line Metrorail in Prince Georges and Montgomery Counties.

Several tributaries in the Potomac River watershed that lie within the project corridor currently support, or have the potential to support migratory and spawning activities of anadromous and catadromous fish; specifically alewife, blueback herring, hickory shad, American eel. These tributaries include Rock Creek (i.e., the mainstem, and Coquelin Run); and, the Anacostia River (i.e., Northwest Branch, Sligo Creek, Indian Creek, Paint Branch, and Northeast Branch). NMFS review of this proposal will focus on the following issues related to protecting migratory fish resources.

1. Direct impacts on migratory, spawning and nursery activities of anadromous and catadromous fish from project construction activities undertaken during the migratory/spawning period (i.e., February 15 through June 15).
2. Secondary and cumulative impacts to the spawning/nursery activities of anadromous and catadromous fish through alteration of their habitat. Such impacts may result from 1) creation of instream barriers that block migratory fish from upstream spawning ground; 2) alterations of stream morphometry and hydrology that change substrate composition and flow regimes; and, 3) subtle and/or incremental changes to instream water quality and hydrology from deforestation of riparian zone, and forested watershed.
3. Project alternatives that will avoid and/or minimize the above types of impacts.

I will be looking forward to future coordination with MTA on this proposal. If you have any questions, or require additional information, please contact me at (410) 267-5675, or, John.Nichols@NOAA.GOV.

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401
410/573-4575

March 23, 2007

Ms. Dawnn McCleary
Maryland Transit Administration
Maryland Department of Transportation
6 Saint Paul Street
Baltimore, MD 21202-1614

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RE: Purple Line, Montgomery, and Prince George's Counties, MD

Dear Ms. McCleary:

This responds to your letter, received, February 18, 2007, requesting information on the presence of species which are federally listed or proposed for listing as endangered or threatened within the vicinity of the above reference project area. We have reviewed the information you enclosed and are providing comments in accordance with section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

Except for occasional transient individuals, no federally proposed or listed endangered or threatened species are known to exist within the project impact area. Therefore, no Biological Assessment or further section 7 Consultation with the U.S. Fish and Wildlife Service is required. Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

This response relates only to federally protected threatened or endangered species under our jurisdiction. For information on the presence of other rare species, you should contact Lori Byrne of the Maryland Wildlife and Heritage Division at (410) 260-8573.

An additional concern of the Service is wetlands protection. Federal and state partners of the Chesapeake Bay Program have adopted an interim goal of no overall net loss of the Basin's remaining wetlands, and the long term goal of increasing the quality and quantity of the Basin's wetlands resource base. Because of this policy and the functions and values wetlands perform, the Service recommends avoiding wetland impacts. All wetlands within the project area should be identified, and if construction in wetlands is proposed, the U.S. Army Corps of Engineers, Baltimore District, should be contacted for permit requirements. They can be reached at (410) 962-3670.

We appreciate the opportunity to provide information relative to fish and wildlife issues, and thank you for your interests in these resources. If you have any questions or need further assistance, please contact Devin Ray at (410) 573-4531.

Sincerely,

G. A. Moor

for Mary J. Ratnaswamy, Ph.D.
Program Supervisor, Threatened and Endangered Species

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Habitat Conservation Division
Chesapeake Bay Program Office
410 Severn Ave., Suite 107A
Annapolis, Maryland 21403

March 19, 2007

MEMORANDUM TO: Dawnn McCleary
MTA, Environmental Documentation, Office of Planning

FROM: John Nichols JSN

SUBJECT: Purple Line, Prince Georges and Montgomery Counties

This pertains to your request for information on resources of interest to National Marine Fisheries Service (NMFS) that may be affected by the proposed Purple Line Metrorail in Prince Georges and Montgomery Counties.

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